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ABORTION IN CATTLE.*

BY VIDORA.

MR. CHAIRMAN AND GENTLEMEN,—In selecting a subject for my essay this evening I have endeavoured to fix on one which is of great practical importance to the veterinarian (especially in the purely agricultural districts), and also to those interested in the breeding and management of cattle generally. To the scientist it offers a large field for observation and investigation, and although of late years much has been done by various savants, still much more remains to be done before our knowledge on the subject is complete. At the commencement it is necessary to recall to mind the period of gestation, the difference between abortion and premature birth, and one or two facts concerning these conditions.

Gestation is the period that elapses between conception and the delivery of the fully developed fœtus, or the period during which the female animal carries its young while this is undergoing development. The time, of course, varies in the different domesticated animals, and even in the same species there are great variations; but confining our attention to the cow, the normal period of gestation in this animal is from 280 to 285 days, 283 days being taken as about the average, and it is a general notion, I believe, that gestation is longer for a male than a female calf, though observations to the contrary have been recorded. The impregnated ovum may be cast from the body, however, at any time during the period of gestation, either enclosed in its membranes, as is commonly the case in the earlier stages, or separated from them, as occurs at a more advanced stage of pregnancy, constituting either abortion or premature birth, as the case may be.

*Read before the Edinburgh Veterinary Medical Society.

Abortion.—This is the expulsion of the fœtus from the uterus of the mother before it is capable of a separate existence—*i.e.*, before development has taken place sufficiently to enable the vital organs to perform the functions necessary for the maintenance of life *ex utero*. The fœtus as a great rule is born dead, rarely is it born alive, and then it is in bad health, emits a peculiar lowing sound, and the third day is attacked with diarrhœa, to which it rapidly succumbs.

Premature birth, on the other hand, is the expulsion of the fœtus from the uterus of the mother before the normal period of gestation, but yet it is capable of living a separate existence.

The cases mentioned above, in which the fœtus lives for a few days only, can scarcely be called examples of premature birth. In practice there is no accurately defined limit between abortion and premature birth, and especially when the latter has been brought about by some of the causes which may produce the former.

The earliest period at which the offspring can live is said to be about 220 days, but the time varies; Fleming says that where the fœtus is expelled 35 days before the normal period, abortion may be considered to have taken place. These two statements will hardly agree with our definition of abortion, but Saint Cyr says if expulsion takes place before the 200th day of pregnancy, then it may be acknowledged that abortion has occurred, and I think he is not very far wrong. I have seen calves of about seven months' gestation live for years; still they were always unthrifty, and of diminutive size, though treated and cared for in the best possible manner from birth onwards.

It is not my intention to describe the anatomy of the various parts, nor yet the changes occurring in the ovum and uterus during pregnancy, as this would take up too much time, and they are sufficiently well known to all of you, so I shall at once enter upon my subject.

Abortion has been known to occur amongst the various domesticated animals for a very considerable period, but yet its true cause was little understood, consequently its prevention and treatment created a wide divergence of opinion amongst the different investigators, each one of whom had his own pet theory regarding its cause and prevention, and even in these days of scientific research, with all the latest appliances and methods at our disposal, its true cause still remains somewhat obscure; nevertheless, by these means we have undoubtedly been put in the right direction, so that we

can with some confidence recommend methods to be adopted for the suppression of this, one of the most common maladies affecting the bovine species.

In the near future it is be hoped that a more definite conclusion will be arrived at, when we shall be able to say that such and such an organism is the cause of abortion.

The chief workers on this subject have been Nocard, McFadyean, Woodhead, and Aitken, in its pathological aspect; Strebel, Galtier, De Poncius, Biot, and Saud clinically. To the untiring efforts of these gentlemen and a few others we owe our present knowledge on the subject. Veterinarian and agriculturist alike are deeply indebted to them for their labours, and for recommending measures from which such good results have been obtained.

Abortion is undoubtedly one of the greatest difficulties the stockbreeder and dairyman (I of course refer to those in the country who combine breeding and dairying together, not to the town dairyman who milks his cows for one period of lactation and then sells them off to the butcher) have to contend against—the animal loss from this cause alone must be something enormous. In the case of the former it may be said that the loss of a newly-born animal is not great, except perhaps in the case of valuable pedigree animals; but this is not all, for if the cause be of a contagious nature, as most people believe nowadays, there is (a) the liability for abortion to run through the entire herd; (b) a tendency for the same animal to abort for several successive years; and (c) even if she does not become altogether sterile she is a very uncertain breeder, and there is the disappointment of losing what might have been a prize-winner. Again, the dairyman requires his cattle to calve at fairly regular intervals, to keep his milk supply at about one level; if one animal aborts he will most probably have to go and purchase another animal to take its place, as the animal which has aborted never gives as much milk as she would have done had she carried her fœtus the normal period of gestation. Added to this are the disadvantages mentioned in the previous case.

Of all the domestic animals the cow is the one most prone to abortion. And why? Is it due to some inherent property, or does the domestic condition (a very different one indeed from what nature intended) predispose to abortion?

A few remarks on the latter point would not be out of the way, I think.

As the ox tribe are our chief supply of food and milk, the attention of breeders has for years been directed to increasing

their milk and flesh-forming propensities, their whole organisation has been completely altered, certain organs being extremely well developed, while others have gradually diminished in size, *e.g.*: in milch cows the lactiferous and digestive organs have become exceedingly well developed, while the vital organs, such as the heart, lungs, and the organs of locomotion, assume a state of atrophy, if I may so term it, from inactivity consequent upon the close confinement to which these animals are subjected during the greater part of the year, and then the close breeding, housing in warm byres, bad hygienic surroundings, and lack of a proper amount of daily exercise, surely have a depressing action on their vitality, and so predispose them to the action of any morbid influence.

Again, during the period of gestation the cow gives a large supply of milk—this is undoubtedly a great drain on her system; and, at a time when she is unfit to bear it, all the nutrition available being required for the fœtus, we thus get an anæmic condition of the mother, and as a result a debilitated circulation and a liability to abortion from causes which perhaps in the natural state would have produced no ill-effects.

Abortion is rarely said to occur, except as the result of an accident, in animals running on the hills, as they are in the condition intended by nature.

I think that sufficient has been said to show that domestication has a certain predisposing influence over the disease in question.

Synonyms.—Partus Immaturus, Picking, Warping, Slinking, Slipping or Casting Calf, Miscarriage.

It is my intention to follow the example of Nocard and others, and treat of abortion under two heads, viz.:—

I. Contagious abortion.

II. Sporadic or non-contagious abortion.

Sporadic or Non-contagious Abortion.

The causes of sporadic abortion may be divided into

I. External. II. Internal.

Amongst *external causes* may be mentioned atmospheric influences, as cold or wet, especially in the case of animals usually housed, although no effect may be produced on animals continually exposed; thunderstorms, and chasing by dogs, causing fright; blows, falls, or injuries on the region over the uterus, as by passing through narrow doorways,

gates and doorways banging to on a windy day; over-exertion, in mares more particularly; drinking of ice-cold water. Water contaminated by sewage has been said by Mr. C. Stephenson to have caused abortion, but this has been denied by others.

Foods doubtless play an important part in the production of abortion, and outbreaks of an enzootic type have been directly traceable to them; and it is generally admitted that frozen or rotten turnips or potatoes, badly harvested or mouldy hay, are injudicious feeding for pregnant cattle, and it is also a well-known fact that summers in which such a class of hay would be largely harvested have been followed by many outbreaks of abortion later in the season. Again, a food which would in any way injure the health of the mother, as by producing obstinate constipation, frequent attacks of tympanitis, or violent purgation, is liable to produce abortion; it may occur as an isolated case only, or at the most as an enzootic.

The administration of drastic purges and other drugs—*e.g.*, cantharides—to pregnant animals is known to be a dangerous practice, whilst surgical or other interference, as casting, should, if possible, be avoided.

Egotised grasses have been blamed for producing abortion, but this is somewhat doubtful.

Access of the male and coition during pregnancy has not infrequently produced abortion; so also has an injury to the vagina and a vaginal examination by the expert, or otherwise.

Others believed that odours had a great effect in producing the mishap. I think this is somewhat far-fetched, as in our practices we meet with cases in which cattle are housed in the midst of the very worst odours, and yet do not abort.

Internal causes.—Undoubtedly one of the greatest of these causes is to be found in the general health of the mother for it is a well-recognised fact that pregnant animals affected with contagious diseases, or any disease associated with a continuous high temperature, frequently abort during convalescence, or during the progress of the disease from which they are suffering—*e.g.*, foot-and-mouth disease, rinderpest. Diseases of the urino-genital organs, and, as before mentioned, obstinate constipation, causing violent straining, tympanitis —violent purgation from any cause—are liable to be followed by abortion. Badly-fed, neglected, or anæmic animals sometimes abort, but those in a plethoric condition, in which there is a consequent congestion of the uterus and loosening of the placenta, are more prone to do so; in the majority of cases I think these causes are insufficient of themselves to produce

such a result, and some other agent must have been in co-operation at the time. Diseases of a nervous character have also been assigned as a cause of abortion.

Close or in-and-in breeding has also been blamed, and particular breeds or strains have been suspected. Hydrocephalus, ascites, anasarca, may lead to the death of the fœtus, and this of itself will cause almost certain expulsion.

Hydraminos, or other diseased conditions of the fœtal membranes, or faulty formation and relation between the placentæ, malposition of the fœtus, often excite abortion.

In former days, sympathy was supposed to play a great part in many of the outbreaks of abortion; for instance, an animal aborts in a field; the others present crowd round it, and in a short time, perhaps, one or two of these will abort. Is this sympathy a cause of the mishap? In most places animals are allowed to perform the natural act of parturition, in the presence of their companions, either in a field or in a byre, and yet none of the rest will abort. Sympathy may play a part in some of the cases, but is it not possible for contagion to be a factor also?

Steele says, owing to nervous influence, if one cow aborts, many others in the same shed will do so also. In my opinion, some other influence must be at work as well.

A case has been recorded in which a cow, after seeing another one slaughtered, aborted in a few days, the fœtus being in every way strong and healthy in appearance, but having a hole in its forehead, from which protruded blood and brain tissue, a true facsimile of an animal that has been poleaxed! Cases of a somewhat similar nature have been reported in the human species.

(*To be continued.*)

RESOLUTIONS OF THE SEVENTH INTERNATIONAL CONGRESS OF VETERINARY SURGEONS, HELD AT BADEN-BADEN, IN AUGUST, 1899.

I.—Preventive Measures against the Spread of Epizootics in consequence of International Cattle Trade.

THE Seventh International Veterinary Congress considers an effective fight against epizootics, in the interest of the individual states as well as of the public economic welfare, both useful and desirable. The means to be employed are a

uniform application of scientific principles, and an efficient regulation of the veterinary department, of the intelligence department respecting epizootics, and of international cattle trade.

But the congress, considering the difference in the economic development and the conditions of traffic, as well as the dissimilitude of veterinary organisation in the separate countries, does not think the moment has yet come for laying down definite principles of an international agreement.

II.—The Prevention of Foot-and-Mouth Disease.

It is in the interest of an effectual prevention of foot-and-mouth disease:

(1) By all and every means to prosecute the scientific investigation of this disease;

(2) To exclude the infected district from free traffic;

(3) To subject the traffic in cattle for sale to a strict veterinary police control in such a way, that the cattle of cattle-traders should be placed under the inspection of the police before sale;

(4) That butter-milk and all other remnants of milk should not be supplied habitually from the co-operative dairies until they have first been submitted to such a temperature as shall insure the extinction of infectious matter;

(5) That the authorities should be required to order in certain cases the slaughter of animals, the proprietors receiving compensation for the resulting loss;

(6) To regulate in the whole country, as far as possible, the initiation, the continuation, and the completion of the needful veterinary police rules, whereby special weight is to be laid upon the strict carrying out of the separation and disinfection of the clothes of the attendants, etc.

III.—The Newest Suggestions for Effectual Meat Inspection.

(1) The congress desires to draw the attention of the Governments of the States officially represented to the necessity of the general introduction of compulsory inspection of meat.

(2) None other than certificated veterinary surgeons can be summoned as professional men to inspect meat. In places where it is still impossible to establish a regular veterinary service, lay inspectors with limited powers may be provisionally appointed. These must be trained for their profession as much as possible by veterinary surgeons in the

larger slaughter-houses, be examined by the State, and constantly be controlled in the exercise of their function by veterinary surgeons. Only veterinary surgeons should be appointed as professional inspectors of meat, and as the directors of slaughter-houses and cattle-sheds.

(3) Instruction in meat inspection at the veterinary colleges must be improved and extended. Meat inspection should be made as far as possible the object of practical examination for a veterinary diploma.

This examination, too, must take place for the obtaining of the diploma as a veterinary surgeon. Moreover, it is required in this case that the candidate shall have worked at least eight weeks in the meat inspection of a large public slaughter-house, standing under regular veterinary supervision.

(4) As a matter of principle, all inspection of meat must be founded on sure scientific bases and experimental rules, which should be agreed upon by an international understanding.

(5) Inspection must be extended to all kinds of butcher meat and be introduced everywhere. It must include all beasts for the butcher and every kind of meat that serves for human food and public use, whether it be destined for public sale or private consumption.

(6) The efficiency of meat inspection is only perfect in those places where public slaughter-houses exist together with compulsory slaughter. On that account, their erection in as many communes as possible is advisable.

(7) It is necessary for the inspection of fresh slaughtered meat coming from outside

(*a*) That the flesh of cattle should be brought in at least in quarters, that of swine only in halves, and that of all other animals in an undivided state, and further

(*b*) That the most important intestines should be in natural connection with the meat.

Fresh meat introduced from foreign countries is subject to the same requirements.

Preserved meat from foreign countries can only be imported if it is kept in a trustworthy, sanitarily unsuspicious manner and its harmlessness can be affirmed with certainty.

(8) Meat authorised for consumption after inspection must be marked in a proper manner (stamping, leading, etc.).

(9) Meat proved to be harmless, but of inferior quality,

must be sold under declaration at certain places ("Freibänke") under the supervision of the authorities.

(10) The introduction of universal and compulsory insurance for slaughter-cattle under State control is urgently required in the interest of meat inspection and the stamping out of cattle diseases.

(11) The results of meat inspection should be collected for scientific and economic purposes in statistics arranged on a definite plan, in which international uniformity should be aimed at.

IV.—*The Prevention of Tuberculosis amongst Domestic Animals.*

(1) The prevention of tuberculosis in cattle is urgently needed.

(2) The extinction of bovine tuberculosis on the part of the owners (voluntary extinction) is practicable, and should be universally aimed at. It demands the slaughter of dangerous tuberculous animals as soon as possible, as well as careful protection of calves and healthy animals from infection.

The voluntary extinction of bovine tuberculosis should be encouraged by the State through the dissemination of correct views respecting the character of tuberculosis, respecting the modes of infection, and the importance of tuberculine inoculation, and be supported by State grants.

The best means hitherto discovered for the prevention of tuberculosis among domestic animals is tuberculine.

Tuberculine should should only be supplied under State control. In any case it should be given to veterinary surgeons alone.

(3) State-prevention of bovine tuberculosis is thoroughly to be recommended.

If it is applied with a certain amount of caution, it can be carried out, and will hinder the further increase of the disease and will gradually stop it.

The prevention requires

(*a*) The obligation on the part of the veterinary surgeon to give legal notice of every case of proved tuberculosis found in the exercise of his practice.

(*b*) The quickest possible slaughter of dangerously tuberculous animals (particularly those animals which are affected with mammitis, tuberculosis of the uterus and of the intestines, as well as pulmonary tuberculosis), compensation being granted by the State, and the prohibition of the sale of butter-milk from the co-operative dairies, until it has been sterilized.

V.—*The Use of the Flesh and Milk of Tuberculous Animals.*

A.—Of the Flesh.

Granted that a general compulsory inspection of slaughter animals exists before and after slaughter, the following measures are to be prescribed in view of danger to the health of the people, which may be connected with the consumption of the flesh of tuberculous animals.

(1) Those professional men who carry out meat inspection are expected to examine the slaughtered animals and so to give a guarantee that every case of tuberculosis among the slaughtered animals shall be reported, and in every case the spread of the tuberculous process will be accounted for with certainty.

(2) The most important part of the meat inspection is the sure detection and the perfect removal of the organs that have been affected by tuberculosis, together with their appendages.

(3) With regard to the flesh of tuberculous animals, the parts connected with tuberculous centres and bound by the corresponding lymphatic glands are to be treated in the same way as the tuberculously affected organs.

If the tuberculous lesions in the meat are confined to the lymphatic glands situated in it, the muscle may, after cutting out the bones, joints, vessels and lymphatic glands, and adequate dissection, be handed over, in a sterilized condition, to be used for food.

In the case of fat animals, the melting out of the fat tissue that has been separated with avoidance of the tuberculous centres is likewise permitted.

(4) In the case of local tuberculosis and in that of general tuberculosis cured and limited to the organs of the cavities, the meat may be sent out raw to be used as food.

If the tuberculous process in the intestines is of considerable extent, the obligation to declare it is to be insisted on.

(5) The whole of the meat, except the melted fat, is to be withdrawn from use as human food, if there exist marked emaciation or the signs of very recent infection of the blood tumour in the spleen, and swelling of the lungs, liver, spleen, or kidneys.

(6) In cases where the local character of tuberculosis and the harmlessness of the meat are doubtful (especially when there are tuberculous caverns and incipient derangement of nutrition), the whole of the meat is to be sterilized before being handed over as fit for food.

(7) The sterilized meat and the melted fat is to be sold under declaration.

B. Of the Milk.

(1) Cows kept for dairy purposes are to be subjected to regular veterinary control.

(2) The milk of tuberculous animals is not to be used for human food, if the animals are emaciated or affected with tubercles in the mammæ.

(3) In accordance with the mode of proceeding in Denmark and Sweden, emaciated and tuberculous dairy animals are to be immediately removed from the farms and sent for slaughter, compensation being given to owners.

The Prevention of Swine Epizootics.

(1) Infectious diseases of swine must be combatted separately, by veterinary police, in such a way that swine plague and rouget should be dealt with on different lines.

(2) The veterinary police regulations against swine plague should consist chiefly in the slaughter of sick pigs and in the disinfection of the infected yards. Slaughter is specially recommended in those districts, which are only temporarily infected with the plague.

The various methods of preventive inoculation, which have not yet been sufficiently tested in the case of either of these diseases, are only recommended for those districts in which swine diseases have thoroughly established themselves.

(3) In order to combat rouget among swine, besides the general measures of sanitary police, it is to be recommended that all animals exposed to the contagion should be inoculated; the inoculation should take place under the surveillance of the veterinary police.

Lastly, it is desirable that vaccination should be compulsory in places where rouget is constantly reappearing.

ABSTRACTS FROM A LECTURE DELIVERED IN THE MEDICAL GRADUATES' COLLEGE AND POLYCLINIC, LONDON, JUNE 8TH, 1899, ON THE PATHOLOGY OF THE FŒTUS.

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Summary.

FŒTAL pathology has more in common with neo-natal and post-natal pathology than have the other parts of ante-natal pathology.

Diseases of the Fœtus.

(*a*) Fœtal diseases are, with few exceptions, the diseases of post-natal life, modified in certain ways. Cause of limited knowledge of their pathology.

(*b*) Classification of fœtal morbid states.
- (*a*) Idiopathic diseases.
- (*b*) Neoplasms.
- (*c*) Transmitted diseases.
- (*d*) Transmitted toxicological states.
- (*e*) Traumatic morbid states.
- (*f*) Pathological states of the fœtal annexa.
- (*g*) Pathology of fœtal death.

(*c*) Fœtal morbid states owe their peculiarities to :—

1. The influence of the intra-uterine environment as shown in :—
   - (*a*) Fœtal fractures and wounds.
   - (*b*) Exanthemata occurring in the fœtus, *e.g.*, variola, erysipelas, etc.
   - (*c*) Fœtal ichthyosis.
   - (*d*) Maceration (without putrefaction and mummification consequent on fœtal death).
   - (*e*) Fœtal rigor mortis.
2. The placental factor as shown in :—
   - (*a*) The possibility of the co-existence of advanced pathological change and fœtal vitality, as seen in the potential morbidity of fœtal renal disease and the potential mortality of general fœtal dropsy and of most teratological conditions of an advanced type.
   - (*b*) The protection afforded against poisons and toxines in the maternal circulation : the placenta as a filter, a barrier, or an accumulator of poisons.
   - (*c*) The entrance of germs, toxines, and poisons into the fœtus from the mother : the placental route practically the only one : the mechanism of placental transmission and the circumstances which modify it : the position of primary lesions in the fœtus.
   - (*d*) The lethal effect upon the fœtus of lesions of the placenta itself : the placenta the most vital and the most vulnerable organ of the fœtus.
3. The embryonic factor as shown in :—
   - (*a*) The modification of fœtal diseases by pre-existing malformations.
   - (*b*) The co-existence of malformations and diseases in the fœtus.

This lecture deals with the pathology of fœtal life. The fœtal period is that part of intra-uterine life which lies nearest to the post-natal, and its pathology has much in common with that which is met with after birth. It is, therefore, convenient to begin the study of ante-natal pathology with the part which in its manifestations most closely resembles the morbid processes of later life. The pathology of the fœtus serves as an introduction to the pathology of the embryo; it also gives an explanation of much that is obscure in the pathology of the new-born.

Physiology of Fœtal Life.

As it is necessary to be acquainted with the physiology of the new-born infant in order to understand the peculiarities of neo-natal diseases, so a knowledge of the physiology of the fœtus throws much light upon fœtal pathology. There are several problems connected with this subject still awaiting solution; but enough is known of intra-uterine life to help materially in elucidating the causes of intra-uterine death.

The chief feature of intra-uterine life is its parasitism. The fœtus spends the whole of its existence, which lasts, roughly speaking, about seven months and a half, in the interior of the uterus; it is immediately surrounded by the liquor amnii, which, serving as a natural water-cushion, protects it from sudden shocks and jars; the uterine walls, by their growth and distensibility, allow increase in size and freedom of movement to the fœtus, while they shield it from harm, and maintain by their vascularity that constant temperature so needful for healthy development; and, external to the uterus, are the partly osseous, partly muscular, pelvic and abdominal walls which serve still further to secure the safety of the tender organism. In its protected position the fœtus makes little call upon several of its organs; its lungs are absolutely quiescent, its stomach, intestines, kidneys, lymphatic glands, and skin are nearly so. The heart and liver, however, are active; and the thymus, thyroid, suprarenal glands, and sympathetic system play a very considerable part in the physiology of intra-uterine life. The brain and spinal cord are quite capable of replying to all demands which are made upon them, their activity being chiefly of the reflex type during this period of the existence of the organism. The most important and the most active of the fœtal organs has not yet been referred to; it is, doubtless, extra-corporeal, and the fœtus is only part-possessor in it; nevertheless, it is the dominating influence in fœtal life, and is absolutely essential to the unborn infant. Without the

placenta intra-uterine existence in the fœtal period is impossible; with it in a healthy condition almost all the other organs may be dispensed with. Fœtal vitality, although not structural integrity, may be maintained by the aid of the placenta alone. The brain and spinal cord may be absent; the intestines may be occluded at several places or reduced to a few coils; the mouth and anus and nares and pharynx may be imperforate; the lungs, kidney, liver, and spleen may be absent; and the heart may be a little more than a dilatation on the chief blood vessels; yet so long as the placenta is available fœtal life can go on.

The Diseases of the Fœtus.

Fœtal pathology is characterised by diseases as distinguished from embryonic pathology, which has malformations and monstrosities as its peculiar possession. I have often been asked, "What are the diseases to which the fœtus is liable?" and I have of late invariably replied that with certain inconsiderabe exceptions it was liable to all the diseases to which later life was liable.

A glance at the accompanying scheme will serve to give an idea of the scope of the pathology of the fœtus.

I. *Idiopathic Diseases.*

1. Subcutaneous tissue and skin, *e.g.* general dropsy, ichthyosis.
2. Osseous system, *e.g.* fœtal rickets, achondroplasia, etc.
3. Digestive system, *e.g.* fœtal ascites, peritonitis, etc.
4. Respiratory system, *e.g.* pneumonia, hydrothorax, etc.
5. Circulatory system, *e.g.* fœtal endocarditis, hydropericardium, etc.
6. Hæmopoietic system, *e.g.* inflammation of thymus, thyroiditis, etc.
7. Genito-urinary system, *e.g.* fœtal nephritis, dilated bladder, etc.
8. Nervous system, *e.g.* paralysis, contractures, etc.

II. *Neoplasms.*

1. Tumours of the head and face, *e.g.* fibro-chondromata, cysts, etc.
2. Tumours of the neck, *e.g.* cysts, chrondromata, etc.
3. Tumours of the trunk, sacral and coccygeal cysts, fibromata, etc.

4. Tumours of the limbs, *e.g.* exostoses, lymphangiomata, etc.
5. Tumours of the internal organs, *e.g.* sarcomata, rhabdomyomata, etc.

III. *Transmitted Diseases.*

1. Syphilis.
2. Exanthemata, malaria, etc.
3. Tuberculosis, sepsis, elephantiasis, etc.

IV. *Transmitted Toxological States.*

1. Lead-poisoning, etc.
2. Alcoholism.
3. Poisoning by morphia, atropine, mercury, etc.

V. *Traumatic Morbid States.*

1. Fractures.
2. Dislocations.
3. Wounds.
4. Spontaneous amputations (?).

VI. *Pathological Conditions of the Fœtal Annexa.*

1. Placenta, *e.g.* tubercle, œdema, cysts, etc.
2. Umbilical cord, *e.g.* tumours, tearing, etc.
3. Chorion, *e.g.* cystic degeneration, abnormal vascularity, etc.
4. Amnion and liquor amnii, *e.g.* adhesions, bands, hydramnios, etc.
5. Decidual membranes, *e.g.* inflammation, etc.

VII. *Pathology of Fœtal Death.*

1. Maceration, mummification, dissolution.
2. Rigor mortis.
3. Putrefaction.

Fœtal Death.

When the fœtus dies in the interior of the uterus, the *post-mortem* changes which ensue are rarely of a putrefactive kind, and this peculiarity finds its explanation in the fœtal environment. In its intra-uterine position the fœtus is protected from putrefactive organisms, save only in the cases in which rupture of the membranes has taken place some time before the supervention of labour. Further, it is

surrounded by the warm liquor amnii, a medium which specially favours the occurrence of the macerative changes which are the pathological expression of fœtal death. Maceration, then, is the process which the fœtal body undergoes when death occurs *in utero* and when the membranes remain unruptured. Occasionally, however, another non-putrefactive change is met with, viz., mummification, the result of which is the production of the fœtus compressus, or papyraceus. This occurs more especially when the dead fœtus is not alone in the uterus, but is in the presence of a living twin, which in the process of growth pushes it to one side and compresses it. Mummification seems specially to characterise early fœtal or neo-fœtal death. In cases of intra-uterine death, therefore, the peculiarities of the environment not only impress themselves upon the fœtal organism, but also have an important and beneficial effect upon the mother, saving her in many cases from blood-poisoning.

There is one point in connection with fœtal death to which I must allude, for it has an important medico-legal bearing: I refer to rigor mortis in the unborn infant. There is no evidence to show that the fœtal environment prevents the occurrence of rigor mortis, yet it is commonly believed that if the new-born infant show *post-mortem* rigidity, it must of necessity have been alive at the time of birth. This dictum, which has Caspar's weighty authority to support it, has not seldom had an important bearing in cases of trial for child murder. I have elsewhere * entered fully into this subject, and have proven, both from personal observations and from literature, that the fœtus which dies in utero, even when it is also premature, shows unmistakable rigor mortis, and that this muscular rigidity may be the cause of difficulty in labour. The immature condition of the muscular system and the peculiar environment may lead to a shorter and less intense rigidity; but that it occurs is certain.

The placental factor in fœtal pathology may be looked at from a second standpoint: the placenta may be regarded as a protection to the fœtus, as a barrier preventing sometimes, if not always, the passage of poisons and toxines from a diseased maternal organism to the fœtus. Porak† and others have experimentally demonstrated some of the ways in which the placenta acts with regard to poisons in the maternal cir-

* Ballantyne, J. W., "Rigor mortis in the Fœtus," *Teratologia*, ii. 96, 1895.

† Porak, *Arch. de méd. expér. et d'anat. path.*, vi., 192, 1894.

culation. It has been shown that it has a real affinity for some toxic substances, and in it accumulate copper and mercury, but not lead. In addition to its pulmonary, renal, and intestinal functions, the placenta fixes glycogen and acts as an accumulator of poisons, and so resembles in its action the liver in the adult. But the storing up of poisons in the placenta is not so general as the accumulation of them in the liver of the mother. While the placenta stores up poisons, it does not on that account altogether prevent their passage into the fœtal tissues, it does not act as a complete barrier. It offers, however, a varying degree of obstruction to their passage; it allows copper and lead to pass easily, arsenic with greater difficulty, and mercury apparently not at all, for Porak always found it in the placenta and never in the fœtal organs. These observations, it must be remembered, were made on guinea-pigs and do not of necessity apply to the human subject; but in the absence of other evidence they have a considerable value.

With regard to the action of the placenta as an accumulator of pathogenic microbes and their toxines, and as a barrier to their passage to the fœtus, a great deal has been learned during the last 15 or 20 years; but the problems which yet remain for solution are very numerous and the difficulties associated with them are extraordinary. The idea that the placenta acts always as a filter, keeping back the bacilli and cocci which may be present in the maternal circulation and so saving the fœtus from their evil effects, must be abandoned. That the placenta acts often as a prophylactic filter is also open to grave doubt. Bacteriological researches have shown that through it can pass the bacilli of anthrax, of fowl cholera, and of typhoid fever, the pneumococcus, the streptococcus, the spirillum obermeieri, the bacillus of glanders, the pathogenic organism of hydrophobia, and the hæmatozoon of malaria. Further, it is not necessary to admit the existence of a placental lesion to explain the passage of the micro-organism, for in the case of animals, at any rate, the most rigorous examination of placentas through which bacteria have been transmitted has shown neither macroscopic nor microscopic changes in them. For the infants of even seriously tubercular women to be found showing tubercular changes at birth is a rare occurrence, and it is only during recent years that congenital tuberculosis has been definitely proven by the discovery of the tubercle bacillus in the fœtal tissues and in the placenta. In this disease, therefore, if in any, it might be expected that the beneficent *rôle* of the

placenta would be demonstrable. Georges Küss*, who has recently investigated the whole question of tubercular heredity in a very complete fashion, is of opinion that even when the tubercle bacilli make their way into the placenta that structure has still the power of protecting the fœtus from the microbic invasion. He adduces in support of his statement the two cases of Lehmann in which the infants were free although the placentas were tubercular, and those of Schmorl and Kockel in which, although there was placental tuberculosis and some bacilli were found in the vessels of the chorion, yet neither the microscopic nor experimental inoculations revealed the presence of fœtal bacillosis. Kuss also noted that the fœtuses that showed infection always had a much less marked bacillosis than might have been expected from the intensity of the maternal blood infection and from the advanced state of the placental lesions. It seems, therefore, fair to conclude that in tuberculosis, at any rate, the number of germs that pass through the placenta must be very small. It must also be borne in mind, however, that even where the organs of the fœtus of a tubercular mother appeared healthy, inoculation of animals with pieces of them set up in some instances undoubtedly tubercular processes. Possibly infective toxines may pass even when the bacilli do not. The placenta cannot, therefore, be regarded as a complete or certain barrier to microbic invasions even in the best circumstances.

Third, it is now necessary to look at the placental factor from quite the opposite standpoint, viz., as the chief if not the only avenue of access for germs to the fœtus. Practically the only other way possible from the mother to the fœtus is by the liquor amnii. Certainly the researches of Ferrari† on the structure of the amniotic membrane seem to show that through its stomata materials may pass from the lymphatic system of the mother into the liquor amnii and then to the fœtus by the mouth and intestinal tract. While, however, it is right to regard this as a possible mode of entrance, it cannot be looked upon as a common one. Probably "water-born" infection is very rare in the fœtus. It follows, therefore, that the placental route is practically the only one from mother to fœtus; and it is a matter of some importance to determine the circumstances that increase or diminish placental permeability to poisons and germs. This inquiry,

* Kuss, G., *De l'hérédité parasitaire de la tuberculose humaine.* Paris, 1898.

† Ferrari, P. L., *Lo Sperimentale*, Ann. xlix., sez. biologica, fasc. I, p. 62, 1895.

of course, raises the whole question of the mechanism of placental transmission, and into that I have not time to enter; but one or two important conclusions may be referred to. It is, for instance, apparent from the study of the comparative anatomy of the placenta that its permeability must vary in different species according to the thickness of tissue intervening between the maternal and fœtal circulations. It would appear from the extensive researches of Duval that in this respect the human placenta occupies an intermediate position between that of the rodents and that of the ruminants. In the rodent the barrier is very slight; in the ruminant there is a fourfold barrier, two capillary walls and two epithelial layers, between the maternal and the fœtal blood. There would seem to be no need for a lesion in the former case, while in the latter some morbid change would almost appear to be necessary before germs or their toxines could pass from mother to fœtus. Again, there is reason to believe that placental permeability varies at the different epochs of pregnancy; this conclusion seems, at any rate, to be warranted in the case of the rodents. The experiments of Charrin and Duclert* are, however, full of interest in relation to the question of placental transmission, and deserve notice. These observers found that certain conditions of the maternal blood favoured the passage of germs through the placenta; the presence in the blood of microbic toxines, *e.g.*, tuberculine, as well as of acetate of lead, alcohol, or lactic aid, seemed to diminish in a marked manner the impermeability of the placenta. Previous inoculation with corrosive sublimate, on the other hand, seemed to make it more difficult for microbes to pass. It would almost appear as if the prolonged presence of the microbes in the neighbourhood of the barrier led to the breaking down of it by the action of the toxine products of microbic vitality. The experiments, it must be borne in mind, were performed on guinea-pigs; nevertheless they have at least a suggestive value as regards the human subject.—*The Scottish Medical and Surgical Journal*, August, 1899.

Honorary Secretaries of veterinary medical societies and associations are informed that if they will forward the MSS. of their proceedings before the 18th of the month, the Editor will have much pleasure in returning them proofs within a few days thereafter, so as to enable them to be correctly inserted in the VETERINARY JOURNAL.

* Charrin et Duclert, *Compt. rend. Soc. de biol.*, p. 563, July 13th, 1894.

Cases.

THE SPREAD OF TUBERCULOSIS BY MILK: A REPORT TO THE HACKNEY VESTRY.

ON February 22nd last the Hackney Vestry adopted the report of its Public Health Committee upon the subject of tuberculosis due to milk, recommending that 100 samples of milk should be obtained in the Hackney district and bacteriologically examined for the presence of tubercle bacilli. The committee, through Dr. J. King Warry, the medical officer of health to the vestry, have now submitted the report of the directors of the Jenner Institute of Preventive Medicine, to whom the samples were sent. It runs as follows:—

Jenner Institute of Preventive Medicine,
August 3rd, 1899.

SIR,—I beg to submit the following report upon the samples of milk forwarded by you to the Jenner Institute for examination as to the presence of tubercle bacilli.

The samples of milk (100 in number) were received at intervals from March 9th to May 30th, 1899. The fresh samples were examined immediately on their arrival. The milk was centrifugalised for 30 minutes, the cream was then stirred from the top, and the whole centrifugalised for a further period of 30 minutes. In this way the bacteria present in the milk were sedimented. The sedimented portions of the milk were used for examination. A series of microscopical specimens was made from each sample, but such a direct examination does not yield satisfactory results. The only reliable test is by means of inoculation experiments, and these were carried out with each sample of the milk. The accompanying table gives the results obtained, both positive and negative.

A period of four to six weeks must elapse before the diagnosis can experimentally be established, and the investigation has consequently extended over some months.

The results may be briefly summarised:—

(1) Seventeen samples of milk were found to contain tubercle bacilli of virulent character.

(2) Twenty-three animals succumbed prematurely. It was consequently impossible to establish a diagnosis in these instances.

(3) Seventy-seven samples were, therefore, fully and fairly tested.

Taking the 77 absolute tests that were carried out, and the 17 positive results that were obtained, the proportion of milks from the Hackney district containing tubercle bacilli was found to be 22 per cent.

I am, yours faithfully,
ALLAN MACFADYEN, M.D., *Director.*

As Dr. J. King Warry pointed out to his vestry, the report reveals a serious condition of the milk supply of Hackney, no less than 22 per cent. of the samples examined being infected with tubercle bacilli. Regarding the question as one not of local concern only, the Public Health Committee recommend that the President of the Board of Agriculture

should be memorialised to introduce a Bill into Parliament to give effect to the recommendations of the Royal Commission on Tuberculosis. They also suggest that a circular should be prepared and circulated throughout the district advising the inhabitants to boil all milk before use.—*The Lancet.*

MALARIAL FEVER IN BOVINES.

In the *Annales de l'Institut Pasteur* we find a paper by MM. Nicolle and Adil Bey on this subject. The disease is variously described as hemoglobinuria of the ox and Texas fever; it is produced by a parasite of the blood, the *pirosoma bigeminum*. It has been observed in different parts of the world—in America, Africa, Roumania, Finland, France—but it prevails specially in marshy districts and presents affinities with paludic fever in man. The above writers have observed it at Constantinople in oxen imported from the Crimea, and that in three different forms—malignant, acute, and slight. In the first form the animal, after a few moments of restlessness, staggers, falls, rolls about a little, and dies; on autopsy blood is found in the peritoneum; further, epilootic and mesenteric ecchymoses, and rupture of the spleen. The acute form begins with fever (40·5° to 41·5° Cent.), want of appetite, absence of rumination, general weakness, but specially in the fore-legs, discolourations of the mucous membranes, stoppage of milk-secretion, and, in two-thirds of the cases, hemoglobinuria. The colouring of the urine is sometimes the sole sign of the disease; as a rule it appears only on the second or third day. The patient dies after an interval of two to four days in a state of coma and hypothermia. The lesions consist in a swelling (and softening) of the spleen, congestion of the kidneys, fluidity and light colour of the blood, which is deficient in red globules; the bile is abundant and thick. The lesions of the liver are irregular: it sometimes presents a golden yellow colour.

In the slight form there is never hemoglobinuria; the disease is shown by fever, a little weakness and emaciation, and by a diminution of the lacteal secretion; the patient soon recovers.

The hematozoon has been found in the blood and viscera, whatever be the form of the disease. The same parasite has been found very frequently in animals attacked by cattle-plague; our authors, who have studied contagious typhus in South Africa, have made the same observation. They have

succeeded in inoculating malaria into imported animals, but have failed with native bovines; the latter contracted only a transitory fever.

EPIZOOTIC KERATITIS IN BOVINES.

In the proceedings of the *Société de Biologie* there is a paper by M. Perrusel conveying his observations on 10 adult cows distributed over eight byres. He says that in every case where care was taken by the owner *at the outbreak* of the disease to apply remedies consisting of antiseptic washing of the visual apparatus, only one animal in two was seriously affected, whilst in all other cases where attention was delayed *both* animals were affected. It is very probable that heat is a predisposing cause, as similar epizootics have been observed by other practitioners at the same time of year.

The initial period of the disease, lasting over three to four days, is characterized by intolerance of light, swelling of the eyelids, and continuous shedding of tears. When fully developed there is produced a strong injection of the vessels of the sclerotic. On the cornea, generally in the centre, appear one or more white spots, of two to three millimetres in diameter, the opacity of which increases rapidly, and in from four to five days become generalised over all the cornea, whilst at the same time a loss of the vitreous substance of the cornea, limited to a very superficial infundibulum occupying the centre of the said spot, extends gradually, but in surface only. This condition remains for 10 to 12 days, then the opacity gradually diminishes in intensity and extent from the periphery to the centre, as likewise the *ulceration*, which in certain cases does not even exist any longer in consequence of the wearing away of the corneal laminæ which it has affected.

In the case of cows to which care has been given late, that is, 10 to 12 days after the outbreak of the trouble, much more intense inflammatory symptoms become apparent. The cornea is of a milky white, and is sprinkled in its centre with fibrinous deposits of a light yellow colour. To the active period (which lasts longer than in the animals of the first group) there succeeds a phase of resolutions, characterized as follows: The central fibrinous mass has protruded, becomes purulent as its opacity diminished, then disappeared, and been replaced by the inflammatory aureola, which from being violet has become bright red, and gradually approached the centre. The purulent focus having reached a head has opened

by a horizontal slit, thrown off buds, and proceeded rapidly towards cicatrisation. Frequently whitish specks persist, vestiges of the corneal wound.

Prophylactic treatment consists in washing the healthy eyes morning and evening with a solution of 10 to 20 per cent. of boric acid, 1 per 2000 of sublimate, and 5 of alcohol. The disease is always confined to the first eye affected in the case of owners who have had the healthy eyes treated preventively, and in such cases it has never spread to the other cattle; this observation is a strong argument in favour of the contagious origin of this form of keratitis.

As curative treatment the same washes are recommended, followed by the application of ointments such as the following:

Calomel, or sulphate of zinc	.. ..	30 centigr.
Chloral hydrate of cocaine	..	10 „
Lard, vaseline, or populeum	.. ..	30 grammes.

In the case of cows of the second group, cauterisation with nitrate of silver of the surface of the purulent focus is recommended in order to hasten the opening, and bring about the cicatrisation of the consequent wound.

BACILLARY PSEUDO-TUBERCULOSIS OF THE PIGEON.

In the pigeon there may be observed a disease characterized by the slow development of subcutaneous polypoid growths in the anterior cervical region. These are large fibro-caseous nodules, sometimes with centres of calcification, which are capable of breaking their way through the integuments and of forcing themselves partially to the outside. At a first glance they give one the impression of large tubercles, but contain neither the bacillus of aviary tuberculosis nor the bacillus of human tuberculosis, nor elements of Aspergillus or any other inferior fungus, nor animal parasites. On the contrary, there are found in them masses of thin rods of varying length, discoloured by the Gram process, easily admitting of isolation by means of cultures, covering gelose at 37° with a transparent coat, uniformly giving a muddy tinge to bouillons, which exhale a fetid odour of sulphuretted hydrogen. These rods, which have a mobility of their own, and are destitute of spores, perform reproduction by transversal segmentation and may be laid end to end. They do not liquefy gelatine, do not coagulate milk, hardly multiply at all on potato; they cause a very active fermentation of

glucose by setting up an acid reaction in the nutritive medium, whilst they remain without action on the molecule of lactose. When this bacterium is injected under the skin of a pigeon's neck one may see a large fibro-caseous polypoid nodule appear in the place, the starting-point of a miliary insemination of the viscera ; death supervenes at the end of about two months. The guinea-pig, when inoculated, has a local abscess, with ganglia suppurating upwards and a pseudo-tuberculosis of the spleen ; the evolution does not take more than eight days. Inoculation into the veins of the rabbit causes an acute and fatal septicæmia. Breeders call this disease of the pigeon—whose point of admission must probably be looked for in the digestive and respiratory channels—by the name of polypus, tuberculo-diphtheria, etc. It is really a case of a pseudo-tuberculosis, the microbic agent of which the author has isolated.—(From a paper read before the Société de Biologie by M. Sabrazès.)

THE BREEDING OF ASSES AND MULES IN EGYPT.

(A French view of the Egyptian question!)

EGYPT is *par excellence* the breeding country of the ass. Besides, no animal would be better adapted to the multifarious services demanded from it. In a country in which the channels of communication are generally defective the ass follows narrow paths with nimbleness, and easily crosses the irrigating gutters which traverse them at every step. In the deserts and rocky hills which border the valley of the Nile to east and west its surefootedness is invaluable ; in the towns it forms almost the only means of transport for the lower classes of the population. The quickness of its gait is not perceptibly inferior to that of a horse at a trot. Two kinds of asses may be distinguished in Egypt, the white or Soudanese ass, the *animal de luxe*, and the ordinary ass, generally of mouse-grey or dirty black colour, with a broad cruciform marking. The former kind, which is far the more esteemed, is exclusively used for riding among the higher class of natives. The rarest varieties fetch from £40 to £48. No selection is used in the reproduction of the common variety. The smallest rural proprietor possesses an ass, a female by preference, which he uses for all his work and which serves him for riding. The price of the common ass varies from

£4 to £5. The whole asinine stock of Egypt may be estimated at 140,000. This species is the only one in Egypt which could usefully be made the object of an export trade. Attempts at acclimatisation in France appear to have succeeded admirably; the products have preserved their qualities there. These animals might be of great use in our far Eastern possessions and in Madagascar. The mule-breeding industry has only a relative importance in Egypt. The greater part of the hybrids met with in that country are imported from Syria or Cyprus. The few mules born in the country are, however, remarkable for their strength and endurance. But their forms are emaciated and their figure somewhat inferior to that of the kinds from Syria and Cyprus. The *bardot* (a smaller kind of mule) is not very rare in Egypt, and some specimens of this kind which we were able to observe had remarkably fine, even slender, shapes and a fine regularity of action. This is the reason why the native products are almost all utilised for riding, whilst the imported animals are more specially meant for draught-work. The average number of mules from Cyprus or Syria amounts to 400 to 500 head annually, each costing about £20.—Communication by the French Consul at Alexandria to the *Recueil de Méd. Vétérinaire.*

THE PROPHYLAXY OF MALARIA: THE WAR AGAINST THE MOSQUITOES.

SINCE the part played by mosquitoes in the transmission of marsh fevers has come to be known, many scientists have occupied themselves with the question of the measures to be taken against these insects. These measures may be divided into two classes: measures which have as their end the destruction of the mosquitoes *en masse*, and those whose object is to protect individuals from their bites. The measures advocated to destroy these insects are numerous. They comprise all the possible ways of abolishing marshes and ponds, by drainage and forming plantations (principally plantations of pine and eucalyptus). The keeping in motion of the water of pools during summer, for example, by means of water-wheels moved by small windmills (Howard), appears to be an excellent method; it has been used at San Diego in Texas. Parks or gardens ought not to be made; they are nothing but receptacles for mosquitoes. As a measure against the larvæ of the pathogenic insects, the reasonable plan has been

suggested of pouring into the water of the ponds common oil, or, better still, petroleum. Twenty-two litres of oil are sufficient to cover efficaciously a surface of 96,000 square feet. It is important to pour in the oil at the beginning of the hot season (Howard, Smith, Weed, Kelloy, Nuttall); petroleum oil of weak consistency has no influence on the lives of the fish. Sulphate of iron and permanganate of potash, both of them highly praised, do not give results so satisfactory as those produced by oil. Fish are good auxiliaries in the destruction of the larvæ (Russell), hence the necessity of favouring pisciculture in malarious countries; the three-spined stickleback (*Gasterosteus aculeatus*) is especially recommended (Howard). Within the last few years particular insects (mosquito-hawks) have been employed in America to destroy mosquitoes.

One of the questions to which the inhabitant of a malarious country should devote special attention is that of the choice of dwelling. He should build his house always on the hills or in elevated spots; inhabit the upper stories of his house; keep away from gardens and ponds; plant round his house trees of the *Eucalyptus globulus* or, better still, of the *Ricinus communis* (Giard); use petroleum-oil lamps and keep them lighted in the room which communicates with his bed-room (Beutenmüller); shut the windows of the latter room early. In some countries big fires are lighted near the dwelling-house. These fires are especially useful when one is sleeping in the open air; in this case do not forget to cover the head with a veil and the hands with gloves To free a room from the mosquitoes which it may contain, the best process consists in burning pyrethrum (Campbell); the mosquitoes fall down and die. Howard's advice is to moisten the powder of pyrethrum, make balls of it, dry them, and burn one or two, as the case may be. According to Weeder, the leaves of *Mentha pulegium* keep away mosquitoes; Eator, to the same end, advises putting a branch of eucalyptus under the pillow. Weed attributes more effect to daily anointing of face and hands with petroleum-oil. In Canada a mixture of tar and oil or camphorated vaseline is used for anointing the skin. The Hudson's Bay Company recommends tar-water for the skins of both men and animals. At Imibirsk excellent effects were obtained by the use of a strong infusion of roots of *Triticum repens* (Beutenmüller). Chappell has quite recently recommended infusion of quassia. Pednoff is emphatically in favour of naphthaline dissolved to saturation-point in liquid vaseline. —*Revue Scientifique.*

A NEW PATHOGENIC PARASITE IN THE BLOOD OF CATTLE IN SOUTH AFRICA.

HERR KOLLE, in a case of cattle sickness which runs its course from remittent fever and emaciation to digestive failure and coma, and finally causes death, found in the red blood-corpuscles round pale amœboid corpuscles filling up almost the whole of the cell; these in the coloured preparation have a great similarity to the malarial parasites of man. The disease differs from Texas fever both ætiologically and also in its duration and post-mortem symptoms. In this disease one is struck by the paleness of the organs, and by the circumstance that these latter become of a deep yellow when subjected to the influence of the air. The blood is watery, spleen and liver swollen. Herr Kolle would call this disease *febris malariaformis.—Berliner Thierarztliche Wochenschrift.*

A CONTRIBUTION TO THE QUESTION OF ARTIFICIAL TUBERCULIN.

Last year, in number 21 of the "Upper Baden Cattle-Breeder," I combatted the erroneous opinion which prevailed, especially in Upper Baden breeding circles, that the feverish rise of temperature which set in in tuberculous animals after an injection of tuberculin was not a specific effect of the tuberculin, but that a similar reaction might be caused by injections of solutions of common salt, distilled water, etc., and I proved by experiments made with this end in view that neither in tuberculous nor sound animals could any febrile reaction whatever similar to that caused by tuberculin be caused by solutions of common salt. It goes without saying that through the prevalence of such an idea, the tuberculin test is discredited and the greatest difficulties thrown in the way of professional men in their efforts to make the application of tuberculin as general as possible. I should not have deemed it necessary to point out the error of this view in veterinary circles had I not discovered a short time ago a similar assertion emanating from French scientists. According to an article in the "Progrès Vétérinaire," a Dr. Sirot of Beaune was able to cause a feverish rise of temperature in tuberculous men by means of an injection of chlorate of soda, sulphate of soda, sulphate of magnesia, and distilled water in certain proportions. The author of the notice added a remark that experiments of this kind might also be made on animals, and, if they succeeded, then every practitioner would be able to make his own serum. These remarks induced me to investigate the matter more closely, and to make experiments

with the compounds recommended by Dr. Sirot on animals also. For this purpose I took of the animals in the stables of the abattoir and cattle-yard such ones specially as might, presumably, from their age, condition, and other circumstances, be found to be affected with tuberculous or other lesions. Injections were made in the way customary in injections of tuberculin, with observance of all necessary caution. The injection-fluid was made up in exactly the same way as recommended by Dr. Sirot, and was composed of—

Compound I.				*Compound II.*	
Sod. chlor.	5·0	and	Sod. chlor.	6·0
Sod. sulph.	10·0	„	Sod. sulph.	10·0
			Magnes. sulph. ..	3·0
Aqua dist.	1000·0	„	Aqua dist.	1000·0

Of this the subjects of the experiment received an injection of 10 to 15 grammes subcutaneously in the side of the neck, which had been thoroughly cleaned and disinfected. The experiments were spread over a total of twelve animals, of which seven were treated with the compound I., and five with compound II. Up to the time of slaughter the animals were kept in the abattoir stables, and we were thus able to keep a close and constant watch on their condition of health. Slaughter took place within four days at latest after inoculation. After slaughter the animals were subjected to a searching examination. As may be gathered from the results tabulated below, subcutaneous injections with the compounds recommended by Dr. Sirot for man were not able to cause, either in completely sound or tuberculous animals, or in animals affected with other diseases or parasites, a reaction in any way whatsoever similar to the effect of tuberculin, but the injections, as was to be expected, remained without any effect, even the slightest, on the condition of the animals in question. Though I should not like to cast any doubt upon upon the accuracy of Dr. Sirot's observations, still, judging from the result of my experiments, it may be affirmed that Dr. Sirot's I. and II. compounds do not offer a substitute for Koch's tuberculin in the diagnosis of cattle-tuberculosis, and that tuberculin still remains at present the best aid to diagnosis in the recognition and final extirpation of a disease so ruinous to our cattle establishments. Consequently the expectations formed by the author of the statement that every one might be able to make his own serum must wait a good while yet for fulfilment. I herewith append an inoculation table:—

INOCULATION TABLE.

Inoculated with Compound I.

Designation of Animal	Temperature before Inoculation.	Temperature after Inoculation. Hours. 12	14	16	18	Discovery after Slaughter.
1st Cow, 10 yrs. old	38·7	38·4	38·2	38·3	38·4	Tuberculosis of lungs and pleura costalis.
2nd Cow, 12 ,,	37·9	38·4	38·4	38·4	39·4	Abscesses in the liver.
3rd Cow, 7 ,,	39·2	38·9	38·6	38·4	38·4	Tuberculosis of lungs and mediastinal glands.
4th Cow, 12 ,,	38·9	37·9	38·3	38·3	38·4	Peritonitis chronica fibrosa circumscript.
5th Cow, 7 ,,	38·8	38·8	38·8	38·5	38·6	No lesions.
6th Cow, 10 ,,	38·9	38·3	38·3	38·4	38·4	Tuberculosis of lungs, pleura pulm., et costalis dextra.
7th Cow, 8 ,,	38·7	37·9	38·3	37·8	38·2	Echinococcus vesicles in the lung.

Inoculated with Compound II.

1st Cow, 10 yrs. old	38·5	38·4	38·0	38·2	38·3	No pathological lesions.
2nd Cow, 8 ,,	38·7	38·8	38·6	39·2	39·3	Tuberculosis of lungs.
3rd Cow, 8 ,,	38·2	38·5	38·4	38·4	38·0	No lesions.
4th Cow, 8 ,,	39·5	38·9	38·4	39·3	39·2	No lesions.
5th Cow, 9 ,,	39·1	38·5	38·4	38·5	38·4	No lesions.

(Contributed to the *Deutsche Thierärztl. Wochenschrift* by Dr. Görig.)

Editorial.

MEAT INSPECTION.

BEFORE the meeting of Council of the Royal College I wish to make one more appeal to my professional brethren on this important subject. I have thought it advisable to summarise the case by collecting the opinions of as many eminent men—may I say, in dealing with a matter so soon to be adjudicated on, as many eminent counsel?—as possible. If I seem to appeal to Cæsar against Cæsar himself the fault is, I trust, not mine; the exigencies of the case and its extreme urgency must be my excuse.

Opinion of Mr. J. F. Winnicott (VETERINARY JOURNAL, September, 1899, No. 291, page 198):—

It was estimated that since 1869 over £1,000,000 a year had been saved to the country by the State Veterinary Department alone. Recognition by local governing bodies might be improved. The dealing with meat and milk, and other matters affecting the food supply of the people, must be put into the hands of the veterinary surgeon.

Opinion of the Irish Central Veterinary Association (VETERINARY JOURNAL, September, 1899, No. 291, page 202):—

We, the members of the Irish Central Veterinary Association, beg respectfully to point out to the Veterinary Department of Her Majesty's Most Honourable Privy Council that only duly qualified veterinary surgeons are competent to properly carry out the duties of Inspectors under the Contagious Diseases (Animals) Act. Professional knowledge, and the training and experience which veterinary surgeons alone possess, are necessary to the proper discharge of the duties of this important office. The appointment of such positions of non-professional and unqualified men, who are incapable of diagnosing contagious disease, constitutes a serious danger to the health of the live stock of the country, and, therefore, to the prosperity of the people. It further seriously embarrasses the efforts of veterinary surgeons to repress and extirpate contagious diseases. The implication conveyed by such appointments that any ordinary layman is competent to diagnose and deal with contagious disease constitutes a grave reflection on the ability and training of the veterinary profession in Ireland, while the occupation of such a position by a layman frequently deprives the inhabitants of thinly-populated poor districts of the services of a veterinary surgeon, who can only afford to practise in such places when his scanty income is decently augmented by the salary attached to the position of veterinary inspector.

Under these circumstances we hope we may be considered justified in respectfully submitting to the Veterinary Department that they should insist that veterinary surgeons are in every case to be appointed inspectors under the Contagious Diseases (Animals) Act.

This was carried unanimously, and a copy of the resolution was ordered to be sent to the Clerk of the Privy Council.

Opinion of Mr. Hedley, President of the Veterinary Medical Association of Ireland (VETERINARY JOURNAL, August, 1899, No. 290, page 140):—

From this it may be seen that, notwithstanding the fact that there is material already available in the trained veterinarian, other bodies are endeavouring to creep in upon what should be allocated to our science. There, however, is evidence that some of the leading corporations of cities are not satisfied by any perfunctorily performed duties as to animal food, and they have veterinarians engaged to attend to see to the abattoirs, to see to the health of cattle giving milk, as well as to attend to other matters bearing thereon. I am aware that in some recent Public Health Acts special clauses have been inserted rendering the services of the veterinary officer necessary before carcases or live cattle are condemned. Although I am not aware of any advances such as I have now indicated having extended to Ireland, yet I think the time is not far off when the wise action already taken in Great Britain will be not only copied, but improved upon, in Ireland.

Opinion of Dr. J. M. Emmert, M.D., Iowa (VETERINARY JOURNAL, July, 1899, No. 289, page 30):—

You are presumed to understand the diseases of animals, both alive and dead, and able to point out and explain the difference between diseased and healthy food products, especially meat and milk. This being the case, no man in the community can be of as much benefit upon the local boards of health as the learned veterinarian, and I think the time is not far distant, or at least I hope so, when every slaughter house, meat market, dairy, or other place where food products are brought and sold, will be inspected and under the supervision of the local boards of health. When that time does come, gentlemen, you will be called upon for your services, and the people will demand that they have the benefit of your knowledge. In fact, it is your duty as well as mine to assist in bringing about this happy result. You understand the dangers of eating meat infected by trichina and actinomycosis, or drinking milk infected by tnbercular bacilli; along with the medical profession and with sanitarians it is your privilege as well as duty to be teachers, leaders, and educators in this great work. The field is not only great, but the work is grand.

The opinion of Mr. Sydney H. Slocock (VETERINARY JOURNAL, March, 1899, No. 285, page 225):—

Such duties as the inspection of meat, of cowsheds, and of dairies, should, undoubtedly, be carried out by the veterinary surgeon, and not, as is so frequently done, by the medical officer and sanitary inspector. From a report of the Yorkshire Veterinary Medical Association we learn that the Leeds Corporation are promoting a bill which shall give to the Medical Officer of Health, or any person acting under his written orders, the power to enter a cow-shed or dairy farm and to inspect, examine and apply the tuberculin test or other reasonable test, to any cow kept for the supply of milk, in order to determine whether such cow suffers from any disease which might render the use of the milk dangerous or injurious to health. The veterinary surgeon is totally ignored. This omission has happily been noticed by Mr. Greenhalgh, and not only has the matter been discussed at the society meeting, but it has been brought to the notice of the R.C.V.S., who will, doubtless, take the matter up strongly.

Opinion of Mr. William Hunting, F.R.C.V.S. (VETERINARY JOURNAL, December, 1898, No. 282, page 427):—

For half-educated inspectors, these principles would have to be definitely formulated in hard and fast rules, but qualified veterinary surgeons would require only the broad principles, as they would possess all the knowledge requisite to classify each carcase at once, and to say whether it should be partially or totally seized.

There can be little doubt that when the public health is protected by a system of meat inspection, the butcher, the grazier, and the consumer will find their best defence in the appointment as inspector of the man who knows most about the subject—the veterinarian.

Regulations in force in (VETERINARY JOURNAL, December, 1898, No. 282, pp. 433-6):—

Belgium (*Brussels*).

The staff of the abattoir consists of a chief inspector, who is always a veterinary surgeon; expert inspectors chosen from among veterinary surgeons or butchers of old standing; a collector, a chief of the service, and customs officers. It is the duty of the chief and expert inspectors to inspect all animals entering the abattoir, and to examine meat before it leaves. The chief inspector makes a report of cases of disease found by him, and generally of all facts relating to the public health and the abattoir.

Germany (*Berlin*).

Inspection of Meat.—In virtue of a minute drawn up in 1887 by the Municipal Council, all meats exposed for sale in Berlin are previously submitted to inspection made by a service named *Städtisches Fleischesamt.* It is composed of a veterinary surgeon of the first class, several veterinary surgeons of inferior rank, collectors of samples, and microscopists.

Vienna.

All cattle brought to Vienna must be accompanied by a certificate of health (*Viehpass*), and they must be examined on their arrival by the veterinary surgeon of the city.

Stockholm.

There are two bureaux of meat inspection, under the control of two veterinary surgeons.

Opinion of Mr. C. G. Hill (VETERINARY JOURNAL, December, 1898, No. 282, page 458):—

In taking a retrospective glance of our profession, we have much to be thankful for, but at the same time we must keep advancing, and bring our views to the notice of the general public, more especially to our town and rural authorities, until we get that recognition which we deserve, and duties that to-day are in the hands of incompetent men are relegated to veterinary surgeons, who by their scientific training and everyday work are the only persons qualified for the posts. In particular I allude to meat and dairy inspection. The office of meat and dairy inspector undoubtedly should be occupied by a veterinary surgeon. Who is more fitting? He is educated up to that standard. His daily work is among cattle, and he alone is conversant with their diseases. I prophesy that our town and rural authorities will awaken up to the fact that it is to the interest of the public

to adopt abattoirs, and appoint veterinary surgeons as meat inspectors who will combine the office of dairy inspector, and devote the whole of their time to the duties of that position. This can only be done by showing to the public that we are what we claim to be—scientific men who are able to keep apace with collateral branches of science with which our profession is so closely connected.

By educating the public to this desirable result, we open up new pastures for our graduates which will counteract the over-crowding that there is every likelihood of taking place.

Opinion of the Western Counties Veterinary Medical Association (VETERINARY JOURNAL, January, 1899, No. 283, page 51):—

That in view of this Conference on Public Health, it is imperative that sounder meat and milk, free from tuberculosis taint, should be distributed, and the premises used for the housing of milk-producing cattle should be suitable; and it is essential that the duty of supervising these conditions should be carried out under the surveillance of qualified veterinary surgeons.

That this conference, recognising the utility of tuberculin as a most valuable aid in the diagnosis of tuberculosis, and as its indiscriminate use would be fraught with danger and would be open to abuse, considers it advisable that its distribution should be officially controlled and its application or use should be placed in the hands of qualified veterinary surgeons only.

Opinion of Mr. A. C. Cope in seconding Professor W. Owen Williams' motion to grant an additional degree (VETERINARY JOURNAL, February, 1899, No. 284, page 114):—

It seems to me that we should endeavour, if we possibly can, to take upon ourselves the duty which the medical officer at the present moment almost invariably monopolises. I venture to say that a medical officer is not a fitting man for this occupation. There are very few medical men who can distinguish the lungs of a pig from those of a sheep, and they certainly can hardly differentiate between any of the organs of the different classes of animals, as to what animal they have come from. They are not, as a body, competent to judge of the natures of the diseases affecting them. As Professor Williams states, there is a powerful movement on foot for the purpose of obtaining powers for the inspection of cows in cow sheds, for determining the condition of the udders, and for deciding whether the milk should be used or not; and in only a few instances does the veterinary surgeon appear at all. It has always been in favour of seeking powers from a medical officer of health, or other inspector, to examine the cows, and decide as to whether they are fit subjects for the milk to be sold from. There is a large field for the profession in this direction, and I should certainly advocate any means which could be taken to bring us to the front in this matter. But, above all, before anything is done, I am convinced that we should never attain any success unless the men pass an examination of an eminently practical nature. We must have men educated in handling beasts and who know the condition of the udder when they examine it.

Opinion of Mr. A. W. Mason (VETERINARY JOURNAL, April, 1899, No. 286, page 262):—

Mr. Mason then reminded them that at the annual meeting of the society they appointed a small committee to consider the sanitary provisions of the Leeds Corporation Bill. The committee had, he said, met twice and had

received the benefit of the advice of Mr. H. A. Child, solicitor. They had also had an interview with the Leeds Parliamentary Committee. At the interview he explained how, in their opinion, the work of inspection should be carried on. He pointed out that it would not be sufficiently done if the inspection was left in the hands of an unqualified person, and indicated the special training of veterinarians for applying the tuberculin and other tests to animals, etc. He asked the Parliamentary Committee to insert the words "veterinary surgeon" in the clause, thereby following the example of the Public Health of Scotland Bill, and also the course proposed by Manchester.

Opinion of Mr. T. M. Inglis, President of the Scottish Metropolitan Veterinary Medical Society (VETERINARY JOURNAL, April, 1899, No. 286, page 273):—

We ought now be pleased that our profession has at last been recognised to have for its members gentlemen who are believed to be capable, and fully qualified as meat inspectors; I am sure you will agree with me when I say we are at last placed in our right position. A public slaughter house or a byre is no place for a medical gentleman, and I am sure these gentlemen cannot possibly think so themselves. Stringent meat inspection cannot possibly be carried out by any other than a qualified veterinary surgeon.

Opinion of Mr. E. Faulkner (VETERINARY JOURNAL, April, 1899, No. 286, page 300):—

In connection with this matter, great credit was due to Dr. Niven for his magnificent paper to the Sanitary Institute of Birmingham, in which he told the Institute that he believed the inspector of meat ought to be a veterinary surgeon who was educated in the inspection of meat, and that there ought to be established a Veterinary Public Health Department. He quite agreed with Dr. Niven, and there was no reason why the veterinary profession should not be able to meet that want, as their students were now taught meat inspection in addition to their ordinary education as veterinary surgeons.

Opinion of Dr. Delépine (VETERINARY JOURNAL, April, 1899, No. 286, page 301):—

The public health required that the state of the cattle and other domestic animals should be watched over very carefully, and for that reason it was necessary that the medical profession belonging to the public health service should ask the assistance of the veterinary profession; therefore, if not this or next year, still within a short period, some veterinary public health service would have to be considered. Several of his medical *confrères* had for a long time foreshadowed this state of things, and it must have been apparent to the veterinary profession also. They would find that the medical profession would assist them in every possible way in obtaining this recognition. The medical profession had the highest appreciation and admiration of them, and keenly felt the need of their co-operation.

Opinion of the Berlin Municipality on milk supply (VETERINARY JOURNAL, May, 1899, No. 287, page 340):—

The owners of milch cows in Berlin must at all times consent to the supervision and inspection of their stock of cattle by the *district veterinary surgeon or his representative.*

Their state of health shall be watched over by the regular district *veterinary surgeon*, or a police veterinary surgeon appointed to represent him, so that, before the installation of a cow, her state of health is attested by a certificate and is revised at least once in every three months.

For the purposes of revision a book is to be kept, inspection of which must be granted to the regular official veterinary surgeon at any time. Every illness of a milch-cow located in a byre along with cows for the production of milk for children, or in a sanitary dairy, if the animal is affected with any one of the diseases mentioned in VI. (*c*), must be notified to the regular official veterinary surgeon.

I add one or two statements in confirmation and extension of the above. The Public Health (Scotland) Act says that none but veterinary surgeons are qualified to give an opinion as to the soundness of animals, during life, to be used as human food.

The Tuberculosis Commission recommended that the duties of meat-inspection should be placed in the hands of skilled persons.

Further, Dr. E. Petronell Manby, D.P.H., at the meeting of the British Medical Association, 1899, quotes the regulations adopted in Germany, and advocates their adoption in this country :—

Regulations made by the Leipzig Council as to the Examination of Cattle and Meat.

The examination of cattle, etc., brought into the market and slaughter-houses shall be made by experts appointed by the council—namely, the director, two veterinary surgeons, six assistant veterinary surgeons, the chief of the microscopical department, the microscopical assistants, and the officers engaged in taking the samples of meat.

The director is the supreme officer of the establishment.

To him are delegated all powers for the examination of meat. All other employés are under his control.

He also exercises final judgment in all cases of dispute.

One of the two veterinary surgeons supervises the cattle markets, and also takes charge of the examination of all imported fresh meat. He is the director's deputy, and has a title of Official Cattle Market Veterinary Surgeon.

The other veterinary surgeon has the supervision of the slaughter-houses and the sanitary department, and is known as the Sanitary Veterinary Surgeon.

A veterinary surgeon is appointed to supervise each of the three slaughter halls.

A veterinary or assistant veterinary surgeon shall inspect all animals entering the cattle markets and lairages.

Animals found to be suffering from disease shall be taken to the sanitary department for observation or slaughter.

All animals shall be inspected immediately after slaughter by the veterinary inspector who is present in the slaughter-hall.

An additional microscopical examination of the carcases of pigs, with a view to the discovery of trichinosis, shall be made by the examiners.

If upon examination the veterinary inspector finds the meat to be good and the intestines healthy, he shall mark each carcase with the veterinary stamp in a noticeable and conspicuous position, and shall order further marks to be placed on the meat by the superintendent of the slaughter-hall.

As soon as a carcase has been marked, the owner can dispose of it as he thinks fit.

Meat which is healthy but of poor quality, calves which are immature, also meat found unhealthy but which may still be eaten—all of which meat is wanting in nourishment—shall be marked as being of less value and of inferior quality, and shall be transferred to the Freibank.

Where animals are found on slaughtering to be affected in a small degree, such as with abscesses, deformities, etc., having no influence on the general quality of the meat, the affected parts shall be taken away and the remainder of the carcase declared by the veterinary surgeon as fit for food.

Meat which upon examination is found to be unfit for human food shall be taken to the sanitary slaughter-house, there to be destroyed in the usual way.

Can the Royal College still resist my arguments and still decline to assist the Government in carrying out the recommendations of the Tuberculosis Commission? I have no doubt that it is due solely to our apathy which has induced or encouraged the Sanitary Institute to offer its assistance to the Government.

At the present moment the veterinary surgeons of London are out of court. In a letter which I have received from Mr. Chaplin, and which I print elsewhere in this journal, he states, through his secretary, that "the duty of inspecting meat devolves upon medical officers of health and inspectors of nuisances." I wonder if the London veterinary surgeon has ever thought of what his position will be ten years hence, when all the private shambles shall have been abolished and each district will possess its own well-equipped abattoir with its own well-paid chief inspector and sub-inspectors—and none of them veterinary surgeons!

Correspondence.

15th August, 1899.

The Right Honourable HENRY CHAPLIN, President of the Local Government Board.

SIR,—I venture to ask if the following statement in the *British Medical Journal*, 12th inst., page 424, under "Inspectors of Meat and other Food," is correct:—

"The duties of a meat inspector can only be discharged by an inspector of nuisances or sanitary inspector." And further,

if the recommendation of the Royal Commission on Tuberculosis, "that no person should be permitted to act as meat inspector until he has passed a qualifying examination," is correct?

Do these two statements mean that holders of the diploma of the Royal College of Veterinary Surgeons are thereby not qualified to hold the posts of meat inspectors, or are M.R.C.V.S. considered qualified without further examination by the sanitary or other institute?—candidates for the diploma of the Royal College of Veterinary Surgeons having now to pass a searching examination in meat inspection and in hygiene before they can obtain the diploma.

I trust, Sir, you will favour me with an early reply, as this matter is of great importance to my profession.

I have the honour to remain, Sir,
Your humble and obedient servant,

W. OWEN WILLIAMS.

Local Government Board,
Whitehall, S.W.,

23rd Aug., 1899.

DEAR SIR,—Mr. Chaplin desires me to acknowledge the receipt of your letter of the 15th instant, and, in reply, to explain that by section 116 of the Public Health Act, 1875, and section 47 of the Public Health (London) Act, 1891, the duty of inspecting meat devolves upon medical officers of health and inspectors of nuisances. No provision is made under the general law for appointing special inspectors of meat, and, where such persons are appointed, they are appointed inspectors of nuisances (or, in London, sanitary inspectors), with the special duty of inspecting meat.

Outside the area within which the Public Health (London) Act is in force, there is no statutory qualification for an inspector of nuisances, but the Board have to be satisfied that the person appointed is suitably qualified. Within that area, however, sanitary inspectors have to be qualified as specified in section 103 of the Public Health (London) Act.

Yours faithfully,

NOEL T. KERSHAW.

W. Owen Williams, Esq.

Obituary.

WE much regret to record the death of Mr. Charles Hunting, F.R.C.V.S. and J.P., on Sunday, the 15th of September.

Mr. Hunting particularly distinguished himself as an authority on the feeding and general management of horses, and had very great experience among pit horses and ponies in the north of England.

In 1882 he read a valuable paper on the "Feeding and Management of Colliery Horses" before the Institute of Mining Engineers, and gave some startling statistics as to the great waste of food and money in the management of many collieries.

We deeply sympathise with Mr. William Hunting, F.R.C.V.S., editor of the *Veterinary Record*, in his sad bereavement.

A CORRECTION.

IN the August number of the VETERINARY JOURNAL two unfortunate errors were allowed to pass. On page 86 my examiner-friend is made to say "there is the excellent *medical* discipline obtained by the study of a foreign language"; what he did say was "the excellent *mental* discipline." He would certainly stare if he saw himself thus misquoted. I must apologise for the oversight, and lay the blame, like most men in distress, on the back of that convenient person the printer.

A little further down on the same page occurs the misleading passage: "otherwise the status quo antea *of* Mr. Dewar's motion was lost." There should be no *of*, and the sentence should end at the word *antea*.

SOME of the State Legislatures in America empower the authorities to slaughter cattle for tuberculosis, and to pay compensation. For example, in Illinois the Live Stock Commissioners of that State are empowered to slaughter animals whenever they deem it necessary, and recently they have ordered the slaughter of a good many on account of tuberculosis. The owners can recover the value of any cattle slaughtered compulsorily, as estimated by three judges selected by the commissioners, but not in excess of 75 dollars per head, which covers all but the comparatively small minority of choice breeding stock.

Proceedings of the Veterinary Medical Societies, etc.

SOUTH DURHAM AND NORTH YORKSHIRE VETERINARY MEDICAL ASSOCIATION.

THE eleventh annual meeting and dinner of the above association was held in the North-Eastern Hotel, Darlington, on 1st September. The retiring president (Mr. C. G. Hill, of Darlington) occupied the chair at the outset, and those present included the president-elect, Mr. J. H. Taylor, of Darlington; Professor W. Williams, of Edinburgh; Messrs. A. Peele, West Hartlepool; H. Peele, Durham; Jno. Wilson, Yarm; P. Snaith, Bishop Auckland, P. W. Dalling, Loftus; C. R. Dudgeon, Sunderland; W. H. Blackburn, Barnard Castle; W. Awde, hon. secretary and treasurer, Stockton-on-Tees.

Telegrams of apology for non-attendance were received from Messrs. E. R. Gibson (Seaham), G. E. Gibson (Sedgfield), and Elphick (Newcastle).

The HON. SECRETARY (Mr. W. Awde) mentioned that he had received a full report, in English, French, and German, of the proceedings of the international conference at Baden-Baden.

The balance-sheet showed an income of £46 12s. 6½d., and a balance in hand at present of £25 17s. 3d.

On the proposition of Mr. SNAITH, seconded by the HON. SECRETARY, Dr. R. Taylor Manson, of Darlington, was unanimously elected an hon. associate. Dr. Manson sent an apology for non-attendance, but hoped to look in after dinner.

The new president, who was received with applause, delivered his inaugural address. He thanked the members sincerely for the honour of election, and said he should do his very best to further the interests of the association in every possible way. Proceeding, he said he always attached great importance to morbid specimens, and asked the members to bring a liberal supply of these, for much could be learnt from them. As to the events and changes of the past year there was not much to say, for all seemed quiet and peaceful. There had been so much said and written on tuberculosis that comment was now unnecessary, and action was more to the point. In passing, however, he might say that he thought they were now all agreed that the disease should be included in those contained in the Contagious Diseases (Animals) Act. They ought to keep pegging away at their local authorities until some action is taken in the matter. This led him on to speak about meat inspection; it ought to be most rigidly carried out. This would perhaps be difficult until private slaughter-houses were done away with and public slaughter-houses established in their stead. But he looked forward with hope that before very long each town would have its public slaughter-house under proper inspection. They saw much in their journals relating to the subject of professional etiquette, and one read many letters suggesting a remedy. In his opinion the subject rested with the man himself, for it amounted to this, that a gentleman knew what proper etiquette was, and practised it. If they were to keep their position they must keep pace with the times, or, as one said, "it is sometimes desirable to keep a little in front of the times." With the four years' course their graduates had more opportunity of being thoroughly acquainted with their work, going over a wide area of learning, and with a good practical training they ought to take their position with any one. Veterinary surgeons, said the president, following other callings besides that of their profession, was a subject upon which one often saw letters. The two most vexed questions were whether a veterinary surgeon should keep a forge and deal in horses. On this point he often thought they needed to be more liberal in their opinions. Take, for instance, a M.R.C.V.S. keeping a

forge. Well, in the country they could very well do without one, but not so in the large cities and towns, where nine out of every ten lame cases, he might say with safety, needed the shoe removing, perhaps altering, and replacing on the foot. So that in his opinion a forge was absolutely necessary to some. Another vexed question was that of horse dealing. Well, this, in his opinion, was far from desirable. A member of the R.C.V.S. ought not to deal in horses to make a business of it in conjunction with his professional work. This, however, did not, in his opinion, prevent them from buying a rising four-year-old or five-year-old hunter, riding him about their practice, and giving him a spin with the hounds; then, when saleable and sound, selling him at a profit, if one should be asked to sell him. But let him be sound, and no screw loose. In that way they saw that perhaps country practitioners were apt to misjudge the town member if he kept a forge, and the town member those in the country if they sold a young hunter at a profit, and thus tried to increase their too small fees. In conclusion, he believed their profession had a brighter outlook than for many years.

Professor WILLIAMS, of Edinburgh, read a paper on "Notes on Various Subjects." He said he had been asked to give his opinion as to the effect of vaccination as a preventive of tuberculosis — whether inoculation would prevent or cure tuberculosis. From experiments made in America and from conclusions by Professor Nocard, of Alfort, it was possible—he did not say it was a certainty—that in the very earlier stages, and in very slight tuberculosis, the progress of the disease might be arrested. But experiments ought to be carried out on an extensive scale, and various kinds of serum ought to be used. He had never known in his experience—which was pretty large—that the disease spread from one horse to another. Was it not possible that if they vaccinated cattle with the serum of a tubercular horse, that they might have a remedy for preventing tuberculosis—if injected into healthy cattle, or to arrest the progress of those actually suffering from the disease. He simply threw this out as a hint. As regarded animals sold for exportation to the United States and Canada, inoculation was performed about a week before sailing. The animal reacted. She was then re-inoculated before being put on board, and there was no reaction. The Canadian Government were now complaining very strongly indeed that the test as applied by British veterinary surgeons was quite unworthy of confidence. But if secondary or tertiary reaction—very necessary—did not follow, the man who performed the second inoculation was not necessarily to blame. Professor Nocard, in a private letter to his (the speaker's) son and himself, said he had an infallible test which would indicate the disease on the second inoculation, but the French Government would not allow him to make it public. Professor Williams proceeded to deal with the best remedies for parturient apoplexy, boned spavin, etc., going at some length into the first subject, and giving some valuable information from the experience of a friend as to remedial and alleviative measures.

Votes of thanks to Professor Williams, to the retiring president, and to the present president for his address were accorded, and the members proceeded to dine.

The Dinner.

The dinner was capitally served, and reflected credit upon the Misses Parsons. The president (Mr. J. H. Taylor) occupied the chair. After dinner the president gave "The Queen," "The Prince and Princess of Wales, etc.," toasts that were heartily drunk.

The ex-president (Mr. C. G. Hill) proposed "The Army, Navy, and Reserve Forces."

A response was given by Captain A. Peele and Lieutenant Awde and Vet.-Lieutenant Todd.

"The Royal College of Veterinary Surgeons" was proposed by one of the vice-presidents (Mr. BLACKBURN), who, in the course of his remarks, suggested a greater provincial representation on the governing body of their college. He coupled with the toast the name of Professor Williams, whose health was drunk with musical honours.

Professor WILLIAMS responded. He said he quite agreed with the proposer of the toast that there were too many professors on the governing body of the college, and that there should be more provincial members of the council. There was, however, the question of inconvenience and expense for the country members.

"The South Durham and North Yorkshire Veterinary Medical Association" was toasted by Professor WILLIAMS, who mentioned that the oldest association was the Lancashire; then followed in a year the Yorkshire Association, which had been very successful. From a long experience he could safely say that they, as a profession, had made great advancement during the past twenty years. And this advancement had been assisted very materially by associations of that kind. He trusted that they had a president as worthy as the gentleman who delivered the inaugural address that day. He knew the president's father. They (the speaker and Mr. Taylor, sen.) were boys together, and he was glad that the son was occupying the honourable post of president. As to their secretary (Mr. Awde), he was the right man in the right place.

Mr. AWDE replied.

"The Sister Profession," "The Visitors," and "The Press" were toasted, and subsequently the proceedings ended.

The harmony of the evening was contributed to by Messrs. J. Stirton, Awde, and J. Forster.

NORTH OF SCOTLAND VETERINARY MEDICAL SOCIETY.

A MEETING of the North of Scotland Veterinary Medical Society was held on 26th August in one of the class-rooms in the Agricultural Department, Marishal College, Aberdeen. Mr. Sievewright, Tarland, presided, and there was a good attendance of members, those present including Messrs. Howie, Alford; Wood, Turriff; Anderson, Keith; Mackie, Aberlour; Cowie, Cornhill; M'Pherson, Huntly; Bell, Fraserburgh; Murray, Cullen; M'Bryde, Strichen; Marsden, Banff; Pringle, Ellon; Cumming, Drumoak; Morrison, New Deer; Beattie, Longside; Patterson, Cluny; Dunbar, Aberdeen; Baxter, Elgin; Crabb, Aberdour; Edgar, Inverness; Peddie, Dundee; and Duncan, Methlick.

Mr. M'PHERSON (Huntly), secretary, intimated that the finances of the society were very satisfactory, and that the membership was now upwards of forty.

After the preliminary business had been disposed of,

Mr. PRINGLE (Ellon) read the following paper on "Scour in Cattle":—

Mr. President and Gentlemen,—I have chosen scour in cattle for the subject of this paper because I have had a great many cases of that disease this summer, and, though I did the best I could to cure them, some of them died, and I bring this paper before you to-day from the selfish motive of gaining information.

Symptoms.—The first-noticed symptom was not always scouring, though generally it was; some began to get thin and to thrive badly before they began to purge; to stand too much in the park, not to be feeding as greedily as they should, but, on being approached, made off, and seemed not to be very ill. Others would be seen to be purging, and, though not thriving well,

they ate well enough, so little notice was taken of them for possibly ten days, and some, no doubt, got over it. One two-year-old Stott to which I was called, and which died on the third day after, was ill over a fortnight before he was taken into the house, while another, a four-year-old cow, was only ill two days.

The fæces are usually very thin, dark in colour, and often with a very bad stench. The tail and buttocks get very dirty. Sometimes, in bad cases, the fæces are mixed with mucous and blood.

The animals lose their appetite, sometimes entirely, and, if offered food of any kind, they wont even put their nose to it, but turn away their heads, as if the smell of it made them sick.

Temperature in most cases normal until the later stages, but I did not see one above 103½° F.

Pulse 60 to 70 per minute, but becomes faster and weaker as the disease progresses.

Ears, horns, and legs vary in warmth at first, and are not continuously cold until later stages of disease.

If the case goes on towards a fatal termination, the animal lies almost continuously with its head round in its flank, its nose resting on the straw; the eyes sink into the head while the eyelids droop, and it begins to grunt, the nose becomes dry and parched, and the mouth clammy with often a fœtid odour.

In the early summer I attributed those cases to the season, climatic peculiarities, and the frosty grass, as they were mostly on low lying farms, and which suffered very much from the intense frosts we had at that time and which occurred nearly every night until well into June. However, I had one fatal case, about three weeks ago, when there was no frost and not on a low-lying farm, and on old grass.

Treatment.—Several had got linseed oil before I was asked to attend them, if they had not I gave it to them combined with tinct. opii and a good dose of camphor, and then followed up with astringent tonics both metallic and vegetable, such as cupri sulph, ferri sulph and cinchona, combined with catchu, cassia, camphor, chalk, starch, or brown flour and ginger, with opium or chlorodyne if there was a grunt or pain. I tried also acid sulph aromat combined with tinct. opii and camphor; and to another I gave several doses of ol terebinth, the first dose in ol lini, the others in linseed gruel.

The general treatment I adopted for those cases which were serious was to take them into the most comfortable byre, well bedded, and have them clothed if necessary. I gave water only sparingly with starch dissolved in it, but one stirk drank very little water.

I had one case, a yearling stirk, which was so much better that I told the owner to let him out for a little into the corn yard where there was some nice old grass. He did so, but put a boy of four to herd him, with the result that he ran off got to a watering trough and took a big drink of cold water. The owner, however, did not take a warning from this, but put him out again with the same boy attending him. He got away and got to a loch where he had his fill of water, and which was not over clean, and with the result that he died about 30 hours after.

To resume the general treatment, I gave liberal quantities of gruels, oatmeal, linseed, starch, and sometimes browned wheaten flour, also eggs and beer. In one case I stopped all astringents and gave ammon. carb. cassia, camphor, and ginger, with a little belladonna extract, but continued the gruels with eggs, boiled milk, and beer. I was sore tempted in this case to give a dose of salts and treacle, as I was certain that the omasum was impacted, but I thought it would just do as well to let him die of his trouble as to kill him with physic, but I did give him some treacle. This stott

drank his gruels himself mostly, and it passed through him little altered in appearance, but had a very fœtid odour. I also, previous to this, gave him a second dose of linseed oil, with one and a-half drams of carbolic acid. I tried them all with all kinds of food, including potatoes and carrots, but those that died would absolutely taste nothing either outside or in.

Those, then, are the principles of the treatment which I adopted. The drugs I used in combinations which I thought best suited to the case.

As stated before, I made one *post-mortem* examination of a two-year-old white stott, the one which lived three days after I first saw him, and was ill fully three weeks altogether. When I first saw him he was passing large quantities of mucous and blood, with absolutely no intermixture of fæces, and in addition to usual treatment, I had him well fomented round belly three times daily with very hot water, dried thoroughly, and then wrapped properly up with an old blanket.

Specimen which was first exposed in opening abdomen seems to have been taken from the fat interposed between rumen and omasum; there were several others imbedded in the fat filling up the spaces between the various stomachs.

The rumen contained a fair quantity of ingesta which was apparently right enough though very fœtid, but as it probably had been there for a fortnight that is not to be wondered at. There was no inflammation of mucous membrane.

Reticulum was healthy, and contained no sand or gravel, or anything else to speak of.

Omasum.—The mucous membrane was a little inflamed in several places, but was certainly not impacted with ingesta, and what was there was neither too dry or hard nor too much of it.

Abomasum showed some peculiarities. It contained absolutely no ingesta. The mucous membrane was much inflamed along whole length, the crests of the ridges especially, and there were a great many little black spots, the largest about the size of a split pea, flat on the surface; on close examination they seemed to be blood spots, rather than necrosed mucous membrane, and on scraping them with the nails they came out leaving an ulcer behind.

Small bowels all practically healthy but completely empty except for a little mucous, etc.

Large bowels much inflamed along whole length, and containing a large quantity of blood and mucous, with very little ingesta. Lymphatic glands of mesentery were intensely inflamed, and four times usual size. All other organs were healthy.

The reading of the paper was followed by an interesting discussion.

Mr. A. DUFF DUNBAR (Aberdeen) then submitted a few observations on "Symptoms of Lameness in Horses," which were of great interest.

This was followed by Mr. HOWIE (Alford) reading the following paper on "Bastard Strangles," which was followed by considerable discussion amongst those present:—

Mr. President and Gentlemen,—It has been my fortune—or is it misfortune?—this summer to meet with a series of cases of what, for want of a better name, I shall call bastard strangles, which arose in a rather unusual manner.

The cases all occurred in mares. In my practice I had nine cases, while neighbouring practitioners had, to my knowledge, other five cases. They all were caused by infection at time of service by one particular stallion. Unfortunately, I did not get the opportunity of examining the stallion, as the man in charge took particular pains to keep out of my way. I have, however, very reliable information about the state that he was in. The stallion was said to be suffering from a very bad cold, and in fact was stabled up for a week for that reason. He came out too soon, and, when he presented himself

at the farms, was discharging a very large quantity of pus from his nostrils. Now, this discharge was the cause of the whole trouble. The groom, unwilling to approach his clients with his horse so evidently bad with cold, carried in his pocket a piece of sponge, with which he wiped his horse's nose to make him presentable, and then returned it to his pocket, where it lay undisturbed until he had finished the service of a mare, when the same identical sponge was produced; this time it was used for wiping down the stallion's penis, of course leaving on it quite a nice dose of infectious matter, which stayed there until he visited his next mare, when the whole performance was repeated.

Nothing amiss was seen about the mares until about ten days to a fortnight after service, when the first thing observed was that the lips of the vulva were swollen and usually a slight discharge of a muco-purulent nature, next a series of small abscesses about the size of a walnut matured and burst around the vulva. The next thing usually observed was very much larger abscesses which formed at the side of the rectum—in many cases these caused straining when fæces were passed. These invariably found in the course of a few days an external opening. During this time the animal did not show much constitutional disturbance, and ate well, and in most of the cases continued at work. In four of my cases the trouble ended here, the animals being apparently none the worse. The other five, however, showed more serious symptoms. They began gradually to swell down the thighs, mammary glands, and right down to the feet. The swellings were very hard and painful. There was in all the cases considerable swelling up the abdomen to the fore legs. The mares persisted in standing, being afraid to lie down. I had to sling two of them, so weak did they become. When these swellings began to appear the temperature and pulse rose to from 102° to 105°. In most of the cases appetite was very irregular, eating well one day and not tasting a thing next. In all these cases except one the swellings culminated in a very large abscess in the udder, and very often one on each half of the udder. The pus which was discharged varied in quantity from a pint to a gallon and a-half. In most of the cases after these abscesses in the udder discharged themselves the mares gradually recovered. The two cases which were most serious I shall describe in detail.

A black mare, four years old, went through all the stages which I have described, except that there was no sign of abscess in the udder. Notwithstanding the tremendous amount of odenia about that region and legs. This case was in slings, and she was making so little progress that I asked my friend the president to come over to give me the benefit of his advice. She proved a puzzling case for both of us. Another symptom which we could not account for was that her near fore leg was so painful that she could not put her weight on it, and yet there was nothing to be seen or felt to account for the amount of pain she was suffering with it. After giving me one or two hints about treatment, he left me not very much wiser, but very much comforted from knowing that I was doing all that could be done for my patient. A day or two after he left this patient developed another symptom. This was sleep. She slept right on for three days and nights. The farmer had to stick pins in her before he could get her wakened up to give her a drench. She would even fall asleep when her head was pulled up for drenching. The farmer was a capital nurse, and kept a boy with a pin to keep her awake until she got her medicine. By the way, the medicine consisted of large doses of hyposulphate of soda and chlorate of potash, alternated with salicylate of soda. Along with this she was getting eggs, gruel, stout, and at times whisky. One night the patient seemed so ill that the farmer thought she would be dead before the morning, so with the notion of making her die happy, he gave her half a bottleful of whisky. Next morning, to his

surprise, the coma had disappeared and the abscess in the udder had burst, and was running copiously. So whether it was due to the bursting of the abscess or the dose of whisky, from that day the case recovered, and is now quite well. It is my belief, and is so still, that this was a bad case of septicæmia with septic intoxication, and that the abscess in the udder acted as a safety valve to the system, so to speak, and drained out the poison or at least the source of it. This mare was ill for over six weeks.

The last case ended fatally after an illness extending to five weeks. The symptoms and course of the disease were practically the same as in the last case, with the exception that the temperature kept up to from 104° to 106° for over three weeks, in spite of febrifuges of almost every kind in the pharmacopœia. There were the same swellings of the legs and under abdomen, abscesses at side of rectum, vagina, and tail, but never one in the udder. Some 12 days before death I discovered on rectal exploration two large abdominal abscesses, one of which appeared to extend from the sub-lumbar muscles right down the off side of the abdomen, while the other was confined to the upper part of pelvis. The largest one appeared to be about the size of a football, while the other was about half that size. As these abscesses were just at the stretch of my arm and gave no external indication, I considered that operation was not practicable, therefore I gave a bad prognosis and allowed the case to go on to a fatal termination.

Now the question before this meeting is, Was this a case of strangles, or septicæmia, or both? I am inclined to think that both is the correct answer, because at one farm where this stallion stayed a night when he was ill, three colts were seized with a very bad attack of strangles after being a night in the box in which the stallion was housed. These cases were the worst I have seen for many years. One of the colts died, while one of the others had large abscesses on different parts of his body, notably in the flanks and in front of sternum.

The only circumstance I regret is that I was unable to examine the stallion which spread the infection when he was ill. I could get nobody to say that he had any of the characteristic strangles abscesses externally.

The moral is obvious. Stallions suffering from colds should be religiously quarantined during the serving season.

Office-bearers for the ensuing year were appointed as follows :—President, Mr. A. Sievewright; vice-presidents, Mr. M'Lachlan Young, Aberdeen, and Mr. M'Bryde; secretary and treasurer, Mr. W. M'Pherson, Huntly; council—Messrs. A Duff, Dunbar; Thomson, Aberdeen; M'Gregor, Kintore; Howie, Alford; Mellis, Inverurie; Paterson, Cluny: and Marsden, Banff. At the close of what was the most successful meeting yet held under the auspices of the society, the members met at luncheon in the Bon-Accord Hotel. Mr. Sievewright presided, and after a substantial repast had been served a number of toasts were pledged.

BORDER COUNTIES VETERINARY MEDICAL SOCIETY.

(*Continued from page* 191.)

Mr. THOMPSON said Mr. Cunningham, of Slateford, whom he had invited to take part in the discussion, was unable to attend, but had sent some notes. Mr. Thompson then read Mr. Cunningham's notes, as follows :—

Tuberculosis is a great subject, and my old friend, Mr. Pottie, I have long known, is a great authority on tuberculosis. It is, I believe, one of his favourite subjects.

An able, observant veterinary surgeon of experience and skill, who for long

years has studied the matter in the living and dead animals, in very flesh and blood, in stall and field, and under all ordinary conditions, should be in very many respects as much an authority on this subject as any scientist or specialist, who for the most part pursues his studies in the laboratory and under the microscope, or conducts his experiments in specially constructed premises, and with, it may be, slightly prejudiced views.

Whether one agrees with him or not, it is quite refreshing to see Mr. Pottie "running amuck" and "full tilt" among and against the crowd of medical professors and practitioners, scientists, specialists, and all and sundry would-be alarmists, who have recently delayed and obscured the subject with their opinions and statements. Our friend from Paisley has here, as always, the courage of his opinions; there is an honest ring in all that he advances, so far as it goes, and I am sure the Border Society and the profession at large will thank Mr. Pottie sincerely for his kindness in presenting the subject, tuberculosis, in an almost unique and very unusual form; for furnishing matter so original, so calculated to provoke discussion and to make all interested pull themselves up and give a reason for the faith which is in them.

But there are spots on the sun, and there are, I fear, a few spots on Mr. Pottie's paper, and I take it as the duty of anyone supplementing or opening the discussion to make, if he can, the spots as well as the virtues plain. Mr. Pottie tells us, with Darwin, "that science is simply common sense, at best, that is rigidly accurate in observation and merciless to fallacy." And to this I would add, in this case, common sense which puts down not only some of the facts, but all the facts, concerning tuberculosis.

While cordially approving of much which Mr. Pottie has said, there is much from which I dissent, and much which he has not said which I think, in common fairness, he should have inserted. The big objection which I find in Mr. Pottie's pamphlet is that all through there is not too much said against tuberculosis. From reading it one is apt to think that, after all is said and done, this is rather a harmless, comfortable disease. Dairymen and cowkeepers, west and north-countrymen, Mr. Pottie tells us, consume an abundant quantity of milk, whether tuberculous or not, and are pictures of health; the dairy cows of Renfrewshire are only affected 10 per cent.; bovine tuberculosis is not the same as human tuberculosis, and presumably cannot produce it; tuberculosis is hereditary, but not contagious or infectious, etc., etc.

All this is comforting, and, thank Providence, there cannot be a doubt that much of it is true. If tuberculosis were really as hereditary, contagious and infectious, and the flesh and milk so deadly as some would have us believe, the number of consumptive patients and the death rate per annum would long years ago have been increased a thousand fold. All honour and praise to Mr. Pottie for his advocacy of the truth in this respect, but there is another side of the question.

Tuberculosis, nevertheless, everyone will admit, is a very prevalent, deadly, and loathsome disease affecting man, and most, if not all, of the domestic animals to an alarming extent—a disease which it is plainly the duty of every medical man and veterinary surgeon to do what in him lies to control and, if possible, eradicate. This is a plain, incontrovertible fact, but I do not find it in Mr. Pottie's pamphlet. However, facts so well known and admitted are at times apt to be overlooked; yet this is, in my opinion, "the fact above all facts" which should be put in front, in centre, and at the end, of every dissertation on tuberculosis—a deadly, loathsome, very prevalent disease, against which every veterinary surgeon should wage bitter war, and regarding which he should not speak smooth words. The danger to human life, and the loss in stock, though at times greatly exaggerated, is yet, in all conscience, sufficiently alarming.

It is a fact, too—though Mr. Pottie to appearance disputes it—that tuberculosis in man bears a close resemblance to, and has an almost complete identity with, tuberculosis in the lower animals; some pathologists say a strict identity. To use the words of one scientist, Professor McFadyean, Koch's discovery of the bacillus removed the last doubt regarding the identity of bovine tuberculosis and human phthisis. Long before Koch's discovery it had been abundantly proved that the bovine disease was communicable to the lower animals by inoculation or feeding. The discovery that the two diseases were identical made it next to impossible to escape the connection that if man, instead of guinea-pigs and rabbits, were made the subject of feeding experiments he also would become infected.

Dr. Woodhead gave tuberculous matter, "uncooked," to various animals, and all the pigs (seven), all the cats (five), and 50 guinea-pigs out of 76 were found affected with tuberculosis.

Dr. Martin gave tuberculous matter which had been sometimes taken from a human and sometimes from a bovine source, and the one pig, and six out of the eight guinea-pigs, and, last but not least, eight out of ten calves, became tuberculous; while Professor Chiene tells us that children living on uncooked food suffer from an intestinal catarrh: the organism gets entrance, it attacks the deeper layers of the intestinal membrane, causing ulceration; next the mesenteric glands and peritoneum. In time it attacks distant parts—the joints, the membranes of the brain, and lymphatic glands; next, the whole body. These extracts have been often quoted, but they still hold good.

The question simply comes to be—Shall we brush aside all the information derived from the work and experiments of the scientists because our essayist tells us that that is a most dangerous proceeding, and believe with him that the diseases are not the same any more than the head and feet of a cow resemble that of a man? They only belong to the same class.

If uncooked tuberculous matter from human source when ingested can so readily produce bovine tuberculosis in a calf or porcine tuberculosis in a pig, what is to hinder uncooked or only partially cooked tuberculous matter from a bovine or porcine source from producing tuberculosis in a child, or in any person whose constitution is below par?

Feed a calf, pig, fowl, or cat on uncooked tuberculous matter, and very speedily these animals show tuberculous lesions, differing possibly in anatomical distribution and even in physical appearance and structure, but still the lesions of the veritable tuberculosis.

Feed a poorly nourished or starving family on partially cooked lights and liver or other glandular structure, or supply its young children with milk abundantly charged with bacilli, and can Mr. Pottie lay his hands on his waistcoat and say there is no danger?

The danger in such a case has been abundantly proved to have been unduly magnified; still, it should not be forgotten that if in a city of many inhabitants only a few cases become established, these few cases become centres of disease, and soon the power of heredity or of contagion or infection, call it what one may, comes into force, and the few may become a hundred and in time a thousand.

Out of the 60,000 or 70,000 persons who in this country each year fall before the onslaught of the bacillus of tubercle, can our essayist say that in his heart of hearts he believes that not one of them has arisen from eating the flesh or drinking the milk of a tuberculous animal? I believe he cannot; and this fact, too, I for one would have been pleased to see set forth more prominently in the paper.

Mr. Pottie tells us that for 20 years he had as many deaths from puerperal fever and stomach staggers as from tuberculosis, and I daresay most of us will join in the statement—I believe I am very much in the same position—

but does that do away with the existence of tubercle among our dairy cows? Certainly not. The slaughtering out for pleuro-pneumonia in 1890—91, and the more successful application of the tuberculin test, effectually dispensed with that fallacy. The majority of animals affected show little if any signs of its presence, though when one analyses them after death the large number are found to be but slightly involved. Still many a fair carcase outwardly proves a veritable tubercular nursery inwardly. I remember many years ago, in company with no less a person than the chief travelling inspector, who knew precious little about the matter—now the assistant secretary of the Board of Agriculture—examining a dozen Ayrshire cows standing side by side, and to all appearance, and to the most careful clinical examination, these cows were healthy and free from disease, and yet on slaughter four were found bad cases of tuberculosis, two of them simply horrible cases. On splitting open their briskets the pleura and its mediastinum were so covered and loaded with deposit that the organs could only be seen in outline. Only the other day, too, at the abattoir I was shown the carcase of a cow in which no trace, save in a little mesenteric gland of tubercle, could be found. A slight bulging, however, of one of the quarters of the udder had drawn attention during life; and the milk from this quarter was found swarming with the bacilli of tubercle. These innocent looking cases would have passed muster with Mr. Pottie's insurance office, but such are just the very cases which, during life, are causing so much harm—the cases which most assuredly should be stamped out.

Mr. Pottie also tells us of "20 Ayrshire cows which had been for six months in contact with a tuberculous subject, and which some professors could not but certify were healthy and free from disease." Now the professor does not live who from clinical examination can detect tubercle in the living subject. I presume the said professor did not employ the tuberculin test nor see the carcases after death, so that their certificate could not be of much real practical value. Did any one ever put 20 Ayrshire dairy cows in strict succession under the test and find not a single reaction? I fear that in the Midlothian dairies at least such an occurrence is rare. Mr. Pottie tells us further that in the human subject tuberculosis always commences at the apex of the left lung. In its form of pulmonary phthisis this may generally be true, but tuberculosis can and does begin at times in a man's finger or toe, or in some of his joints and glands, and not unfrequently attacks his abdominal and other organs, just as in the lower creation I fear our good friend Mr. Pottie, in some of his statements, is trying "a little dust in the eyes." Mr. Pottie devotes the latter part of his paper—11 pages or so—to the discussion of the hereditary on the one hand and the contagious or infectious nature on the other—of tuberculosis.

Into this region I have no inclination to follow him; such discussions have always to my mind been little more or less than a waste of words and time. With the enemy plainly in view, a good general does not much consider the different colours of his coat, or the line of his descent, or the rate of his multiplication; his plain, and evident, and first duty is, if possible, to circumvent, subdue, and destroy that enemy. Medical men and veterinary surgeons might well, I think, agree, and combine to agree, to "hang up" all vexing and puzzling questions as to this foul disease, and go arm in arm and shoulder to shoulder against it. When there is any doubt it is better to err on the safe side, better not to give the disease the benefit of the doubt; yet *tuberculosis has all along had the benefit of the doubt.* Eminent breeders all over the country, and our own friend, Mr. Pottie, cry out that tuberculosis is hereditary and not contagious. Danish, German, French, and British scientists retort that there are not a half-dozen congenital cases in 10,000 calves examined, and go in for breeding healthy stock from diseased animals.

Government wastes five or more years in determining what common sense had long ago settled. One professor gives a learned treatise on the pathological aspect of the question; another takes up its microscopic structure; another studies its bacteriological characteristics; while a fourth enlightens the public as to its commercial value: each and all most commendable subjects, but all the time little or nothing of practical value is being done. Tuberculosis holds the field—laughs at its enemies, and slowly but surely is claiming its victims. The line of demarcation between heredity and contagion will not, I fear, be clearly defined in this generation. One instance appears a clear case of heredity, another as clearly one of contagion, while others appear a mixture. Congenital tuberculosis appears comparatively rare among human beings. Yet how often does a healthy-looking young man or woman go down from phthisis at 19 and 21 years of age, or a married man at nearly 40—himself and his wife and several children in succession falling victims to the disease—while others go free. Whence is the cause of such cases? Contact only or heredity? If tuberculosis can remain latent and hidden in the human subject for 20 or 30 years, why should our scientists expect to find it invariably or even frequently in newly-born calves? Was the tuberculosis from which this orphan lad died at 22 years of age caused simply and solely by contact with his consumptive relatives 19 years before his own demise? Who is able to answer such questions? Every veterinary surgeon can tell you of premises and stock in which tuberculosis appears to have a settled habitat. There were a few cases there 20 years ago, and a few cases every now and again since, and a few plain cases there now. What keeps it up, heredity or contagion or both? An old cow, you are told, has been in the stock for twenty years, and she has had 18 calves, but a good many younger and fresher cows have been put down from beside her. There are a good few graves of piners round another steading, and here is a little stirk, 15 months, with a mass of hard, gritty tubercular deposit, 15 lbs., in its chest—a beautiful case of heredity, one would say, till told that this calf was bought with the stock at birth, and that its mother stands at the next farm a grand, healthy cow; but possibly this poor calf, like our essayist's cases, may have had an unknown tuberculous father. This dairyman is down in his luck, and buys only the poorer class of Ayshires. There are a few piners, and some suspicious cases here. Where have they come from? Are they the product of hereditary tendency, or of simple contact and infection? Who can tell? But a fact, which Mr. Pottie has not mentioned, stands out prominently. And that fact is the plain and evident duty of the Government of this country, with the aid of the veterinary surgeon in charge, to put down all such known and plainly affected stocks, and pay moderate compensation to the owner. This in the best interests of all stockholders and of the country at large.

Having performed this duty, and had all such stocks slaughtered out, an enormous amount of good would ere this have been done. There would have been comparatively fewer centres of disease, and time might then have been obtained for the more leisurely process of tuberculin testing and isolation. Why should the great value of pedigree stock stand in the way? What is the real and true value of a tubercular bull or cow whose internal organs are beastly masses of tubercular deposit? £30 for the bull, and £20 or £10 for each cow found affected—more, comparatively, than was allowed for pleuro and swine fever.

As for breeding healthy stock from a bull whose lungs are rotten, but whose testicles are said to be sound, or from a cow with tubercle in her udder and belly, but whose uterus is presumed to be unaffected—that is not a very British proceeding.

Down with all such continental systems of breeding, and down with tuber-

culosis, wherever found, should I think be our motto; and in this good work no one, I am convinced, will join more heartily and conscientiously than our good old worthy friend, Mr. Pottie, of Paisley, though he does not say so very plainly in his pamphlet.

Mr. THOMPSON said he would supplement the papers now read with one or two remarks. The specialists and others who wrote on tuberculosis said the disease was infectious and that animals below par in a debilitated or poor condition were the subjects most likely to take the disease. But practical men would bear him out that when a number of two-year-old-stirks were suffering from extensive diarrhœa or scour, and reduced to skin and bone, people generally said they were rotten, but on *post-mortem* they could not find a tuberculous lesion among them; yet they lived alongside animals affected with tuberculous disease. On the other hand, they found the fattest and best-looking animals, when slaughtered at the abattoirs, laden with tuberculosis. How did they account for this? He was pleased to note that many of the great specialists were coming round to his way of thinking, that the bacillus was not all; they wanted suitable soil and special and favourable conditions, moisture and warmth. The following extracts are from an address given by Professor Sims Woodhead, before the members of the Boroughbridge Agricultural Society. "The bacillus required a special soil, its own kind of climate and moisture, just as much as any crops did, and it would not, however, flourish on unfavourable conditions." "Even where the bacillus was present, the soil and conditions must be suitable before tuberculosis would be produced." Again Dr. Woodhead said: "*If they had unhealthy cattle for breeding, they got unhealthy progeny.*"

This is not in accordance with Professor Bang's views; but Professor Woodhead, further on in his remarks, says: "It was not necessary to sacrifice valuable breeding stock for the sake of tuberculosis; they might breed from tuberculous animals under certain conditions." This is a direct contradiction to what he had previously stated. As for removing calves directly they were born from the presence of the mother—he, Mr. Thompson, was speaking within bounds when he said that fully 90 per cent. of the calves were taken at once from the dam, put into boxes, brought up by hand, and scarcely ever saw the parent again—where does the infection come in here?

Professor Woodhead said that "the particles of dust along with the tubercular bacillus inhaled into the lung set up very frequently tuberculosis in the lungs of the horse." This is decidedly opposed to practical facts, as tuberculosis in the horse is very rare indeed, and is considered to be due to milk given to the animal when it was a foal, more particularly when it had lost its mother. He had been in practice over 40 years and he had only seen one case in the horse. Mr. Carlisle told him he had only one case in his long experience. Professor Woodhead talked about sunlight destroying the bacilli. Why did sunlight not destroy it in Australia, in the Soudan, Arabia, and other hot climates?

The poor old cow was alone being blamed for spreading the malady, and yet it was thought every animal under the sun was subject to consumption, and one animal could affect another.

Had there been a typical case proved where a cow had given the disease to man? He did not believe it. Is there a case where man has given the disease to a cow? He would not believe it. He wanted proof. As to cubic air space, they knew that in the Queen's dairies, where there was abundance of pure water, food, light, air space, etc., there had been a serious amount of tuberculosi. So much for sunlight and air space. With reference to calves not being born tubercular, were there not diseases in the human subject which were possibly born with them, but did not show itself until adult life.

He alluded to suicidal tendency, which was not developed in early life. There was also madness and other maladies. In the horse we have navicular disease, roaring, etc.—not seen in early life. He believed tuberculosis could lie latent for years. He had known cases of consumption lie dormant for between 70 and 80 years, but claimed its victim at last.

With reference to Mr. Pottie's three tubercular calves by a tubercular sire, and three healthy calves by a healthy sire, and all from one cow, this pleased him, as it was exactly his practical experience, and he had known the disease as much spread by the male as the female—at least, that was his opinion. Has it ever been proved that the disease is not transmitted from parent to offspring? As far as I know, no.

It was said *tabes mesenterica* among children was on the increase. He would like to know if a *post-mortem* examination was made on the bodies of all the cases as certified dying from *tabes mesenterica*. He believed the great increase of mortality amongst children was due to the parents letting them suck air and sour milk from badly-cleansed tubes and feeding-bottles, which caused more intestinal catarrh and death among children than ever cow's milk did. An important matter had lately been set forth by Judge Steavenson at Whitehaven County Court. He tried a case where a man bought a cow which had recently calved, and sold as being correct, but died about a fortnight after purchase, and turned out to be a bad case of tuberculosis. The auction mart rules prohibited any person from bringing into the mart animals having "any disease of an infectious nature." The veterinary surgeon told the court that this was of a highly infectious nature, and the judge ruled that, according to the auction rules, the exhibitor had no right to expose the cow amongst other cattle, and gave judgment for the purchaser. The only way the auction mart people could protect themselves was to specify the disease as scheduled under the Contagious Diseases (Animals) Act. *As tuberculosis was not scheduled,* Judge Steavenson—a very heroic man—had raised a precedent that neither the House of Commons or the Board of Agriculture had done According to his decision, a man could claim his money back under these circumstances, even if it was six months afterwards, if the veterinary surgeon proved that the disease was of old standing. Auction marts would have to be very careful. He still held that there was a great amount of visionary work regarding tuberculosis.

The CHAIRMAN said there was little for him to say. They were a long way from seeing the end of this question. It was one of the most extensive diseases in animals of the bovine as well as of other species that they had to face.

It might, he thought, be dealt with by a special Act of Parliament. One thing he would say was that when cows got into an advanced stage of tuberculosis they should be compulsorily slaughtered, because it was dangerous to have them. Still, they were sold, and went away for human food, or on board ship for sailors to eat, yet one rarely ever saw a consumptive sailor. Was it if they became affected they were thrown overboard to infect the fishes?

Mr. POTTIE, in replying on the discussion, said there was no diversity of opinion on the subject before Koch's discovery of the bacilli. Professor Dick lectured to them, and said it was hereditary. He was a man of close observation. Did they think he would be deceived? or that the hundreds of people who lived before him were deceived? If any of them doubted the hereditary nature of the disease, let them test him and he would prove it to them by facts from ais own establishment. Why was it that tuberculin had not been taken up by the farmers? Because they had no faith in it. They did not believe the disease was infectious. They believed more in its hereditary nature. He could give numberless instances of what might be called a perfect test.

Farmers in Renfrewshire would not use tuberculin. If they found it anything like perfect they would adopt it. He quoted the opinions of Professor McFadyean and Professor Fullerton, and asked if they corresponded with Mr. Robinson's opinion? Were they going to be more Gladstonian than Gladstone? They were just on the border line in the way of examining into this subject. Twenty years ago the bacilli was known, yet nothing has been done. If they knew all about this disease being from the germ, they should have begun long ago and done something. But all they had done was to widen the area and make the possibility of stamping out the disease extremely difficult.

Mr. HOWE: That is what I say.

Mr. POTTIE said the veterinary profession had given over the disease to the medical profession, and if they said the medical profession understood bovine tuberculosis as well as the veterinary surgeon did, he asserted they made a great mistake. They were shut out from almost every commission that was appointed, there were farmers and others, but the veterinarians were nowhere. They had not stood firm.

The public know that there is no such thing as poison from this milk; the advice was to boil it, but did they boil it? No! they laughed in your face, and no one was killed.

Did anyone know of his own knowledge a single individual contract the disease by eating meat or drinking milk? A gentlemen wrote that the Royal Commission found out that meat and milk did infect. If tuberculosis was such a contagious disease, why was it not put under the Contagious Diseases (Animals) Act? He submitted that there were differences between bovine and human tuberculosis, and he referred to Mr. Hunting's statements to show self-contradictory opinions which were held.

Mr. ARMSTRONG moved a vote of thanks to Mr. Pottie.

Mr. ROBINSON seconded the motion, which was agreed to.

The CHAIRMAN proposed that Mr. Pottie be made an honorary member of the society, and said he would like to hear him next time on the subject of abortion, in the treatment of which he had been very successful: he heard that in a herd of 80 to 90 cows 36 or 40 aborted, and Mr. Pottie stopped it.

Mr. HEWSON seconded the motion, which was carried with applause.

Mr. POTTIE, in reply, expressed his thanks and assured the members that if he read a paper on abortion it would certainly be original.

The members afterwards dined together, Mr. Lindsay in the chair, and what they lacked in numbers they made up with conviviality, passing a genial and pleasant evening in the land of Burns.

SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

ON the invitation of the President, Mr. J. B. Tutt, F.R.C.V.S., a meeting was held at Winchester on July 20th. The following members of the profession met the president at Dumper's Restaurant: Professors F. T. Hobday, W. A. Edgar; Messrs. J. Simpson, Maidenhead; E. Whitley-Baker, Wimborne; T. B. Goodall, Christchurch; H. Hall, Southampton; J. T. King, Bournemouth; H. Redford. Winchester; Burden, Southampton; Hulford, Haslemere; Spencer, Basingstoke; and C. Pack, Lymington, hon. secretary; Messrs. Goodall and Gibbs, students from the Royal Veterinary College, were also present.

The party were driven in a brake to a farm about a mile from the city, where Professor Hobday gave a demonstration upon one rig, and one monorchid, and the standing operation on two colts; the operations took longer than

anticipated, and the business portion of the meeting, and a paper by Professor Hobday, had to be adjourned to the next meeting.

In the evening the president gave a dinner party at Dumper's Restaurant, when, in addition to the gentlemen mentioned above, a few private friends of the president had accepted invitations and were present. Amongst the number were the Mayor of Winchester (Councillor Forder), the Rev. A. C. Dicker, Dr. G. Wickham, and Mr. D. T. Cowan (Director of Technical Education to the Hants County Council).

Letters expressing at their inability to attend were received from Sir Henry Simpson, Professor Pritchard, Mr. Wragg, Mr. Wheatley, Mr. Carter, and others.

The President's hospitality was much appreciated. The menu card, which had been especially designed by Mr. J. H. Horwell, Art Master, Hants County Council, was an interesting *souvenir* of the occasion. After dinner the loyal toast, and that of "The Mayor and Corporation," were given from the chair.

Mr. JAMES SIMPSON then proposed "The Southern Counties Veterinary Medical Association." He remarked that the association had existed for a great number of years, and had given pleasure, instruction, and profit to the members residing within the circle over which its operation extended. He was afraid visitors sometimes went away with the impression that there was but little enthusiasm in the ranks of the veterinary profession when they saw how few attended their ordinary meetings. It was possible, however, to make the meetings a very great success, and the programme that day had been the means of attracting a larger number of members together than they usually had the pleasure of seeing. The fact of the forethought of the president having provided very instructive food for them that afternoon; the fact of his having been able to secure the assistance of their excellent friend, Professor Hobday; and the further and not unimportant fact of their president having invited them to be his guests at dinner that night, had all contributed to a most successful gathering. He congratulated the president upon the position he occupied. They were not a large association, but it must be gratifying to any man—he knew it was to himself when he had the honour to represent them as president—to be elected to the position their friend, Mr. Tutt, occupied that evening. He could only say that if their president continued in the way in which he had begun, there was not the smallest doubt the members would rally round him in large numbers. On behalf of the association he conveyed to the president their appreciation of his kindness, and, with their permission, he would incorporate the toast, "Health and Prosperity to our President."

The toast was very cordially received.

The PRESIDENT, in responding, expressed the pleasure it gave him to welcome the association, and his pride at being able to gather together so many members of his profession. When they elected him, he told them the honour was quite unexpected, but as they had elected him, he should certainly try his best during his year of office to do all he could for the prosperity of the association, and for the profession in general.

Mr. PACK (secretary) added a few words of a business character, and also conveyed to Professor Hobday the thanks of the members for the information he had imparted to them.

The PRESIDENT gave "The health of Professor Hobday." This toast was very cordially received.

Other toasts followed, and a pleasant evening was shortly afterwards brought to a close, members having to leave by train.

LANCASHIRE VETERINARY MEDICAL ASSOCIATION.

(*Continued from page* 223.)

Discussion.

Mr. Wm. Woods (Wigan) said he could not sufficiently express his gratification at having heard Dr. Delépine's paper, because it dealt with tuberculosis from a commercial standpoint. In considering it from that point of view, it would be useful if the practitioners from different districts stated their difficulties in endeavouring to eradicate the disease because, undoubtedly, different districts would meet with different difficulties. He had found that in town byres in his locality the cattle were almost invariably not younger than the fourth or fifth calf—in other words, none would be below six years old. There might be exceptions, of course, but, generally speaking, the cowkeepers tried to buy cows of that age, their consideration being as to the greatest quantity of milk rather than as to the quality. In the cases he had tested the reactions had been often as high as 90 per cent., and this fact he had been almost afraid to mention until in conversation with others he found that there were practitioners who had also experienced that great percentage. Now, supposing such a cowshed had to be dealt with, and that the cattle which did not react could be isolated, which was not always very easy to do, it would seem that there were several methods in dealing with it. In the first place it might be—in fact it had been—suggested that those cows which reacted should be fattened off, and that in replacing them the cows should be tested previous to purchase. That sounded reasonable, but it was a very difficult thing to do. The sellers in his district were dealers, who were quite willing to have their cattle tested, but veterinarians knew quite well that in a cow tested after, perhaps, travelling by road a considerable distance and having changed its home two or three times within a week, the test would not be reliable. Mr. Woods then spoke of his experience in taking animals on a fortnight's trial, the dealers consenting to same on condition that £2 were paid with each animal returned. He found that three out of every four would react, so that the fourth animal kept would cost some £6 or £8 more than its worth in the open market. Again, in towns the cowkeepers did not want to keep their cows any great length of time—not more than twelve months at the outside. They wanted to milk them, as they say, "one note." Immediately a cow gave less than a certain quantity of milk she was sold to the butcher to be killed, generally for £3 or £4 less than she cost as a calver. Now, if to this usual loss of £3 or £4 is added the £6 or £8 she cost more than her market value, it would be seen how impracticable was that method. The next proposal was to go to the breeder and have the cows tested there. This was all very well if the breeders were somewhere near the towns, but in his district the cowkeepers did not want the cows bred near the town on account of the smoky surroundings. It was easy to go into the country, but what would it cost a town cowkeeper to send a town practitioner into the country to test one or two cows—for a cowkeeper with only 20 cows cannot have a lot of newly-calved cows all at once? He had to buy one every two or three weeks so that his milk supply might be regular. The cost would be so great as to render that method impracticable. It seemed to him there were only two methods. First, a liberal compensation to any one who would take the thing in hand like Mr. Gair Ashton and kill all reacting. Second—and he would like to say this was the only one which appeared to him to have any chance of success—to educate the breeders, and by a moderate compensation to them to induce them to test their cattle when young, and when the loss was only small when they reacted, then they could sell their cattle to town men, guaranteed to stand

the test. As to the value or reliability of the test, town practitioners had no chance of following up their cases in his district, owing to the fact that they had only private slaughter-houses, and he was perfectly in the dark as to the value of tuberculin as a test from his own *post-mortems*. He supposed they had read the statements of Professor McFadyean as to his testing the Queen's cattle. Out of 40 cases two were wrong. In one case in which a reaction had taken place there was no symptom of tuberculosis which could be discovered. In the other case the bronchial gland of the cow was moderately affected, yet she gave no reaction and she proved to be tuberculous. That seemed to him to be a serious point, and indicated that we had not yet learnt all there was to know about tuberculin.

Mr. S. LOCKE remarked that he had listened with much pleasure to Dr. Delépine's most interesting and instructive paper. Such papers would be of great benefit to the Government when they took into consideration the question of compensation. The reason, he thought, why Mr. Long did not take the matter fully in hand was because he was not quite prepared as to the amount of loss that would arise on the cattle which had to be destroyed. They were led to believe that 50 to 75 per cent. would be the loss, but veterinarians had found from experience—at least, he had—that the salvage was a very large one. Mr. Ashton's cases, quoted by Dr. Delépine, were in cattle in full milk, and had taken the price of such. Of course, they were not worth so much for meat as those which had finished milking and were fairly fat for the butcher; but in some cases he had obtained the full value for cows, even from the milking stock, and from those which were not very fat. In connection with the testing of the Queen's cattle by Professor McFadyean, he noticed that one animal did not give any indication of tuberculosis, although it was afterwards found to be a case, and that the temperature was taken after ten hours. If it had been taken some six hours afterwards, he believed that there would have been a result, as he had seen the temperature rise after the 15th, 16th, and 18th hour. Along with Mr. King he examined a lot of Irish cattle, with the result that only about 10 per cent reacted, and *post-mortem* proved them to be cases of tuberculosis. The others were perfectly free from the disease, and did not react. He was afraid that in towns where cows were kept a long time there was a good deal of tuberculosis. He had in mind a lot of 40, and another of 10, which were tested, and every case reacted. The animals were not killed. The 40 lot was a very valuable lot of short-horns, and the owner was perfectly astounded at the result; but he intends having them tested again in six months to see if there is any alteration. Concluding, Mr. Locke said he had no doubt whatever that tuberculin was as safe a test as it was possible to get—in fact, there was nothing safer. Mistakes were bound to be made at times. Even in the cases of Professor McFadyean, where there was reaction and no tuberculous deposits found, there would be some exciting cause which, if fully examined, would account for the temperature rising.

Mr. LAITHWOOD considered the heartiest thanks of the society were due to Dr. Delépine for his splendid paper. As to the tuberculin test, his experience of which was considerable, the errors he had come across were very few indeed. In only two cases out of some 1,400 tested had he been able to find that tuberculous condition had resulted, although no reaction had taken place at the time of injection. Two other errors were discovered on *post-mortem*, in which the animals did not react, but no tuberculous lesions could be detected by the naked eye. At the same time he would not go so far as to say that because no lesions were apparent, none were present; in fact, it would be impossible for anyone to say that. He had no hesitation in testifying to the reliability of tuberculin. It was a most valuable agent and of the greatest possible service to farmers if they could be persuaded to

make use of it. It would pay them to have their cattle tested, and to weed out, as opportunity occurred, those which reacted. He did not approve of wholesale slaughter, and if the farmers did as he suggested very little loss would result, at any rate, nothing like the loss experienced by the county council at Worleston, or in those mentioned by Dr. Delépine at Ford Bank. He had always strongly advocated that some compensation should be given by Government to assist in eradicating the disease. The public who were, and had a right to be, protected, ought to pay their portion for being protected, and if it was right to grant compensation in the case of pleuro-pneumonia, in which there was no danger to human life, surely there was a greater reason to grant compensation in tuberculosis, a disease which caused more suffering than all the other diseases in the kingdom. The amount required for compensation had been considerably overestimated, seeing that only 5 to 7 per cent. of carcases which were tuberculous were not fit for human food. In any case the compensation would be for a year only, or two at the outside, whereas the compensation for other contagious diseases, such as swine fever, had been going on for a number of years. With regard to the loss on stocks which had been tested, the fact of the enhanced value of those animals that did not react appeared to have been somewhat lost sight of in the consideration of that question. Tuberculosis of the udder had been mentioned, and he had a peculiar experience in an animal at Worleston—the only one in which Dr. Delépine was unable to find tubercular bacilli—it reacted considerably, but on examination of the udder no enlargement of any portion of it could be detected although Dr. Delépine said it was giving dangerous and tuberculous milk. Whilst not having had any connection with town dairies he quite appreciated Mr. Woods' difficulties with regard to them, for he (Mr. Laithwood) had association with country dairies which had been extremely tuberculous. He knew of four in which every animal was tuberculous, and quite recently he tested a stock of 45, and only eight out of that number passed, although each animal was as healthy-looking as it was possible to be. He suggested to Mr. Woods the entire removal of the cows and cowkeepers from the town to the country, and the testing of the young stock as early as possible; then anyone buying stock, no matter from where, would get sound animals.

Mr. J. B. WOLSTENHOLME, after warmly thanking Dr. Delépine for his instructive paper, emphasised the necessity for the abolition of private slaughter-houses and the substitution of public abattoirs throughout the kingdom, combined with an efficient meat inspection by competent and authorised veterinary inspectors. Until this want was supplied he did not see how it was possible to successfully combat the disease which produced such dire results. Another point of importance was the value of certain certificates of soundness and freedom from tuberculosis in cattle. Manchester and other towns had recognised the need for the production of milk declared to be from cows absolutely without the taint of tuberculosis. This had been insisted on as a condition by sundry of our hospitals and infirmaries, which would only take milk from those vendors whose cows were certified not to have reacted when tested with tuberculin. This had had its effect on private individuals who were anxious to have the same protection, and thus it was that milk carts bearing the inscription, "Non-tuberculous milk supplied," were to be seen going through the city. There was a danger, however, in the granting of certificates, for unscrupulous persons might give them without proper examination, and it seemed to him that if certificates were to be of any value, before long only those from certain recognised persons would have to be accepted by the community—in other words there would have to be an organisation of veterinary inspectors empowered to give certificates having a definite value, and that those from persons other than

specially appointed individuals would have to be refused. If steps were not taken to prevent the improper granting of certificates and the improper use of genuine certificates, he thought that the reputation of the profession would be very much discounted.

Mr. JOHN DUNSTAN (visitor from Cornwall) gave his experience of the tuberculin test, which went to prove the reliability of tuberculin. With Mr. Wolstenholme, he was of opinion that the use of tuberculin should be confined to official veterinary surgeons, as there was no doubt that its use was open to very great abuse.

Mr. J. H. CARTER, in proposing a very hearty vote of thanks to Dr. Delépine for his excellent paper, confessed that his small experience of tuberculin had not been of the very best. He thought it was imperative that the Government should do something in the way of compensation. In view of the great infantile mortality due to this disease it demanded that liberal compensation should be granted.

The PRESIDENT seconded the proposition, adding that there was one thing in the aspect of the whole question which, in his opinion, appeared to have been lost sight of—that was the consumer who, unfortunately, seemed to be the least interested. It was a question whether the consumer could be persuaded to pay one farthing more for the milk, although it was guaranteed non-tuberculous. It was quite evident that the public would have to be educated on the subject, and in Huddersfield the corporation had adopted a persuasive method, by means of which the cowkeepers within a certain area had their cattle tested free of charge by veterinary surgeons appointed by the corporation. The results, so far as the testing was concerned, were about 40 per cent. reactions, but it was remarkable the small number of udder reactions. He believed that if the Government stepped in and for a couple of years put into operation the tuberculin test as a compulsory method, compensating the owners of such animals which had to be destroyed, within three years at least there would be a comparatively healthy stock of cattle in the kingdom. Another thing that occurred to him was whether the veterinary profession was altogether reliable, as he had heard of certain veterinary surgeons who had fraudulently used tuberculin. It was necessary that the use of tuberculin should be confined to official veterinary surgeons.

Dr. DELÉPINE, in reply, tendered his heartiest thanks for their very kind reception. It struck him that the question of official veterinary service, and isolation sheds erected by the corporations in districts, and of temporary compensation for cattle slaughtered, appeared to be the best means of dealing with the disease.

NATIONAL VETERINARY ASSOCIATION. 1899.

A PAPER on "Spavin" was read by Veterinary-Major F. Smith, A V.D., in which he stated his present views, and referred his hearers to a paper he wrote on the subject a number of years ago. We are only able to publish the discussion and Major Smith's reply.

Professor MACQUEEN: Mr. President and Gentlemen,—The first question is: "Is there any particular shape of hock more liable to the disease than any other?"

I must say that inferentially I agree with the writer. There is no special conformation of hock particularly liable to spavin. Hocks of every variety of shape you will find affected more or less with what is called spavin.

Then as to the origin of spavin. Major Smith does not attempt to answer the question. He does not attempt to untie the knot, he merely cuts it. He

says that disease begins in the bone and extends to the cartilage. How does he know that? And he immediately proceeds from that statement to the causes. Now, as to the place of origin I have not the slightest doubt that there is a great deal of academical interest in the origin of the disease called spavin, but in practice it is a matter of no consequence whether the disease begins in the bone or in the cartilage. If I must say anything regarding the origin of the disease, I would say that most likely it originates simultaneously in both cartilage and bone, and for the reason that I cannot apprehend any sort of bruising, such as one can imagine occurring in the causation of spavin, sustained by the small bones of the tarsus that does not at the same time implicate the articular cartilage. Those who take the trouble to examine hocks, whether spavined or not, will very soon discover that the lesions are quite as well marked in the cartilage as in the bone. And apart from the unimportance of the question in practice, I submit that it has not been proved by anyone that the disease originates in bone tissue alone. It has been surmised, and the speculation has been more or less supported by specimens, by microscopical demonstrations, and so on, but it has not been proved, and I believe that it will be unproved until some interested millionaire or other will devote so many hundred pounds to the purchase of horses for the purpose of proving the origin and extension of spavin disease.

Then as to the causes. The author says that the causes operating should mainly be of the nature of shock, or concussion; and he says: "This concussion can be imparted when the limb is off the ground." I should like Major Smith to explain how concussion occurs when a limb is off the ground. I can imagine a kind of concussion such as striking a swinging ball, and I can imagine a shock imparted to the bones of the hock when a horse lashes out. But that is not the kind of concussion which usually results in disease of the tarsus, and I do not believe that if Major Smith had taken time to amplify his statement he would have been inclined to leave this clause standing in its present nakedness. He would have been inclined to add something by way of explaining what he meant by concussion imparted when a limb is off the ground. In the very next part of the same sentence he admits that more frequently concussion is communicated by the foot when on the ground, or just before leaving it. Now, observation suggests, if it does not teach, that horses contract spavin, or the injury that results in spavin, usually when at work, and generally in starting or stopping a load. If you pay attention to 'bus horses, a class of animals particularly prone to spavin, you cannot fail to observe the struggling that sometimes occurs when the pavement does not supply the best foothold. The same sort of accident occurs when a horse is backing a load into an archway, or when starting a load the slipping is very marked, and compression at the anterior aspect of the tarsus must be very great indeed. To demonstrate the effect of compression would take a long time, but I believe that one can imagine in a rough sort of way that the forces of compression meet at the tarsus; that is, when the horse is about to start a load there is so much compression or resistance communicated by the ground on which the feet are placed, and there is so much compression exerted by the muscles above in the effort the horse makes to start. I believe that bruising of the tarsal bones—not only of the bone substance, but of the tarsal bones, including the articular cartilage—is a cause in the production of the disease.

The last part of the question, or of the writer's view concerning it, relates to hereditary predisposition. Now, if there is any bugbear in connection with spavin, it is hereditary predisposition. There is nothing proved concerning hereditary predisposition. It may be an accident, very often it is a mere coincidence, but there is no proof that spavin is hereditary. I know it is very generally believed

that the disease is hereditary, and that the Horse Breeding Commission accepted this affection as an hereditary ailment. But I am not aware that, beyond mere opinion, there is anything in favour of regarding spavin as an hereditary disease. If one could specify the kind of hock that is nearly always affected with spavin, one might go the length of saying that defective conformation of the hock is transmitted from sire or dam to the offspring, but as we cannot incriminate any special conformation of hock, it seems to me that in the present state of knowledge the hereditary transmission of spavin must be left in the category of things that may be believed, but which require a great deal of faith.

The third question asked is: "What is the definition of spavin?" I would modify that question, and perhaps improve it. There might be a difference of opinion about the improvement, but I think a better way to put the question would be: "What is the nature and definition of spavin?" Definitions are very convenient things for examinations, but definitions in actual practice are not very useful, and they are sometimes rather dangerous. I do not think that anyone should volunteer a definition of spavin disease until the pathology of the affection has been satisfactorily worked out. The cause of the disease is still undetermined, the exact nature of the lesion has not been ascertained, and therefore to advance a definition is always risky—and that applies not only to spavin, but to any affection where the facts are not known. I notice that Major Smith recognises the difficulty. He says it is a very difficult thing to define. I quite agree with him.

Now I pass to the fourth question: "Is there more than one variety of spavin, or are there two distinct diseases of the hock which we speak of by this name?"

I believe that there is only one form of spavin, and that spavin, or spavin disease, which is probably the better way of describing it, may show an exostosis, or not. But every spavin, whether large or small, shows some amount of articular disease. I do not agree with the writer's view that there are two varieties of spavin. I believe there are several degrees of spavin disease, some very serious, others not serious at all. And in order to make myself perfectly plain, I wish to say that I believe, as everyone is obliged to believe every now and then, that the old-fashioned idea that spavin was simply an exostosis of the antero-internal aspect of the hock was based upon imperfect knowledge. There is no case of the disease with exostosis in the usual place without some amount of articular disease. I certainly could not agree with the writer of this paper in recognising two varieties of spavin on the basis which he defines. He says: "A curable and incurable form." I know of no sort of distinction in the way of cure between one spavin and another. I certainly should not like to predict that a given spavin is a curable one and that another spavin is an incurable one, and I do not think that Major Smith would do so himself.

To the next question: "Which bones are most commonly affected in spavin?" I quite agree with the author that the bones most commonly affected in spavin are the bones he names—cuneiform, magnum, and medium. The magnum I do not recognise as cuneiform, but prefer to call it scaphoid. I think it forms a much better designation. The two bones most commonly involved are the scaphoid and cuneiform. The small cuneiform, placed altogether within or almost behind the joint, escapes in the great majority of instances. I notice that Major Smith says that the small metatarsal are very seldom involved, but I think if you will look carefully amongst the specimens on the table you will find one or two that show fairly extensive disease of the articular head.

Now we come to what may be called the longest question: "What is the best way of judging a hock, and what are the fallacies to avoid?" Major

Smith has a great fondness for negatives. He seems to look at a question in a negative manner. I generally look at a question in the other way. I should change that question and say: "What is the best way of judging a hock, and what are the facts to observe?"—not "what are the fallacies?" The writer of this paper believes that the proper way to judge a hock is by sight and touch. I believe that the proper way to judge a hock is by touch. I do not trust to sight. I have tried experimentally that sort of way of judging by sight, and I maintain without further talk that anyone who depends upon his judgment of the existence or non-existence of spavin by sight is pursuing a very risky course. It may be that hocks which look suspicious, or perhaps plainly spavined, are not spavined at all, and I do not see any great advantage in taking up time by pursuing or occupying certain postures in front of the horse, at the side of the horse, or behind the horse. The examination of the hock by hand, as recommended by Major Smith, does not appeal to me as just the very best way. It may be that I am somewhat dense, but in following the description of examining a hock with the hand, standing on the near side, I can only say that I should not exactly carry out the examination as Major Smith suggests. There can be no disagreement as to the best way to examine the near hock, but I certainly should not turn the index finger of the examining hand towards the rear of the off hock if I went so far as to try to examine the off hock from the near side. I do not believe in passing the right hand from the left hock to the right. With practice one will obtain quite as reliable information from the sense communicated by the left hock to the right hand, and by the right hock to the left hand. In other words, I use one hand for each hock, and I do not appreciate the difference mentioned by Major Smith. Most veterinary surgeons are more or less ambidextrous. Major Smith says here that an error may be corrected, but it introduces another difficulty. He says: "We have mentally to transfer to the left hand the impression conveyed by the right, and the transference is an extremely difficult matter." I do not think it is a difficult matter. Now, in continuation of his statement Major Smith points out the difficulties he has experienced in the examination of hocks. He describes the structures that ought to be felt as being clothed with various tissues, and that an accurate knowledge cannot be communicated to the hand. Well, I daresay there is something in that, but if the hand is constantly passing over hocks it very soon becomes accustomed to the feel of what is known as a sound hock. I have never been able to follow those refined practitioners who are able to distinguish the ridges of the cuneiform and scaphoid bones.

There is another point in connection with this question—coarse hocks. I notice that Major Smith says: "The inner profile of hocks free from spavin is not the same in all horses; this is due to anatomical peculiarities: the bones of the hock may be unduly prominent, especially the head, the metatarsal bone, the ridge of the medium, and the head on the inner splint bone. To such hocks the term 'coarse' is legitimately applied; one hock, however, cannot be 'coarse' while its fellow is 'fine.'"

That is where I differ from Major Smith. I maintain that one hock can be coarse—in other words, that its conformation may be different from the conformation of the other, and it may be an absolutely sound hock. It does not follow that because hocks are unequal that one is unsound and the other is healthy, and I cannot understand anyone with experience of horses, or even of the human subject, advancing such a statement. Everybody knows that we are born with hands of an unequal size. I do not say it is the rule, neither are odd hocks the rule. But very frequently we see persons with hands of unequal size, we see persons with unequal feet, we see persons sometimes with one eye stronger than the other, sometimes with one ear better than the other. Then in the growth of the hair—unfortunately I

cannot give myself as an illustration—everybody knows there are frequent instances of the hair growing stronger on one side than the other. Then there is the old-fashioned illustration of the person having more muscle on one side of his body, more strength on one side of his body, and larger bones. The same thing occurs in the horse—and why not? We have an illustration in what we call odd feet in thoroughbreds. If every odd-footed thoroughbred horse is a horse with navicular disease, I should like to have it proved. I am quite prepared to accept the statement that occasionally an odd hock is a diseased one, but because hocks are unequal in size at any particular part, therefore the hock that is a shade larger will be a diseased one, I deny. Major Smith says: "Experience shows that an enlargement which constitutes spavin in one horse may in another be perfectly normal." Now it would not be difficult to make something out of that statement, because an enlargement which constitutes spavin in one hock cannot constitute something else in another: it will constitute spavin. That is not what the Major means, but that is what his statement implies; this he calls a paradox—and I agree with him.

Then he says: "Never give an opinion about a doubtful hock unless it be examined from both sides of the body." I do not agree with him there. I should give an opinion about a horse's hock examined on one side of the body, and I have frequently done so—in fact I do so every day—and I do not hesitate to give it; and if I could refer speedily to Major Smith's original paper I believe he says there that it is absolutely impossible for anyone to say that a hock was free from spavin. Well, there are two ways of saying whether a hock is spavined or no. There is the way of answering the question anticipated by the client, and there is the way of answering one's own conscience. I pursue the plan of answering the question asked by the client—assuming that the client is a man of ordinary intelligence, who does not expect me to dissect every hock I examine, but asks for an opinion for which he pays—and I give him an opinion to the best of my ability, and there I am content to leave it. If in due season someone should discover the existence of spavin, then of course I must take the consequences, which, I think, are inseparable from the practice of the profession. If a man take sufficient time and care to ascertain to his own satisfaction the existence of disease, and he should give an opinion that disease is not present, it would be very difficult to obtain any sort of conviction against that man.

The next question is: "What are the conditions which arouse suspicion as to the soundness of a hock?" The Major only knows two, namely, a prominent ridge on the medium, and a prominent head on the large or small metatarsal bone. Now I will add a few more. Wounds, bruises, and other injuries of the hocks sustained by young stock, colts, fillies, foals. When an animal is first shod on the hind feet, or in scampering about, the skin on the inside of the hock may be cut. He may be cast for castration, and wound the inner surface of the hock. When such an animal is submitted to a veterinary surgeon six months, nine months, or a year afterwards, the hocks are found unequal in size. The veterinary surgeon is assured probably by the owner that the injury was sustained some years ago, and even the manner in which the injury was sustained may be satisfactorily explained. What is the examiner to do in a case of that kind? Is he to certify that the hock is sound, or to certify that the hock is spavined, when there may be no spavin at all? I think the only thing the veterinary surgeon can do in instances of that kind is to examine the hocks carefully. They are certainly suspicious, and I have endeavoured to explain the cause of the suspicion.

"Will the spavin lame or not?" It is a very practical and important question, says the author, and his answer is, "I do not know." Well, I do not think that anyone can answer the question. I have more often to consider

what causes the lameness, and I notice that this is a part of the subject that Major Smith has altogether omitted. I should like him to tell us what induces the lameness. Is it the disease process going on in the joint, in the bone, or in the periosteum? Is it due, as at one time was thought, to periosteal stretching? I believe that when spavin lames a horse the lameness arises in consequence of disease—the disease is active either in the joint or in connection with the periosteum, or both. There are other points in connection with this question as to the position of the spavin, and a repetition as to the hereditary nature of some spavins and so on, which I shall pass by. I should like to devote a word or two to the symptoms and diagnosis of spavin-lameness, and then go on to the prognosis.

First of all I should like to obtain from the members what their views are regarding the usually accepted symptoms of spavin lameness. Does a horse lame from spavin drop on the lame side? Does the quarter sink on the lame side? Does the horse take a short step with the lame limb? Does the horse always wear the toe of the shoe? Does the horse always flex the hock when at rest? Does the lameness always disappear or diminish at exercise? Does wasting or atrophy of the muscles of the quarter always occur? What is the value of the spavin test, that is, prolonged flexion of the hock? What is the value of side movements, moving away from the lame side, moving towards the lame side? Is the lameness better marked when the horse moves from the lame side, or when he moves towards the lame side?

Then there is a further question, not only applicable to spavin lameness, but to cases where spavin exists—diminished hock flexion. There are members of the profession who do not hesitate to recommend the purchase of horses with well-marked spavin, so long as they have fairly good hock action, but they hesitate or altogether refuse to recommend purchase if a horse trot with guarded or diminished hock action. Now I believe there is a good deal of fallacy about this, because hock action in horses having healthy hocks varies considerably, and hock action, as we know, also varies considerably in horses with spavined hocks. If a horse goes sound, free from lameness behind, should we reject the horse simply because he appears to go stiffly on his hocks. On this question regarding the symptoms of hock lameness I should like to hear the opinions of the members present. I have not given my own view, but that is of no consequence.

Now I come to the very last part of the subject: "What is the prognosis of spavin?"

Major Smith says as a rule the prognosis is good. After all that precedes, he says that as a rule the prognosis is good, by which I understand he means that a horse with spavin, not lame, may work on for years. That is what he means by a good prognosis. He does not say anything about the prognosis of spavin lameness. That I shall treat separately. But as to the prognosis of spavin without lameness, a very important point in everyday practice, notwithstanding public views, traditional views, views handed down from teacher to pupil, and so on, I believe that horses with spavin, unmistakable spavin, may work for years without showing the slightest lameness, and I believe there are many horses working satisfactorily in spite of extensive hock disease.

Horses can be produced with unmistakable bone spavin exostosis, and presumably articular disease, that are working satisfactorily, and have been working in that manner for years. I can show you here two specimens in firmation of this statement. Here, for instance, is the right hock of a well-bred cab mare, with very extensive articular disease between the metatarsus and the last row of tarsal bones, articular disease between the scaphoid and the cuneiform, ankylosis and exostosis. The disease was active at the time of

death. The horse worked continuously in London for two years. She died in consequence of a twisted gut, and at her death the hocks were secured. Here is the other hock, which has been divided in a different manner. It shows extensive exostosis with ankylosis of the small bones. Here is another specimen from a 16-year-old hunter, which was in the possession of the owner for nine years. He hunted in Herefordshire, never missed a day, and was never known to be lame behind. He was killed in consequence of an ulcerated lateral cartilage of a fore foot. Neither by sight nor touch could one indisputably assert that the hocks were spavined, but on examination, as you will see from these specimens, both hocks were found ankylosed between the scaphoid and cuneiform bones. There are many other cases where the disease is merely commencing either at the articular margin or altogether on the articular surface, where there is no ankylosis, but merely some defect of the cartilage, and more or less of the bone beneath. These are cases where the horses were never known to be lame, and yet the disease had commenced, and perhaps had advanced between some of the tarsal bones. Therefore my opinion regarding the prognosis of spavin without lameness is decidedly good—*i.e.*, I am a shade more hopeful than Major Smith, and I do not think that the position of the enlargement, or the age of the subject, plays a very important part.

Then as to the prognosis of spavin lameness, which is a very different thing. I do not think that any case of spavin lameness can be considered hopeful, because we are brought face to face with a disease which is likely to go on—it will perhaps extend, and the lameness in many cases may increase rather than diminish. So that my view of the prognosis of spavin lameness is always most guarded, and I do not think that any one in practice can hold a very different opinion.

What kind of treatment is the best to adopt ? I do not intend to deal with that question at all. The writer says, "I have nothing to add to what is already well known." I believe in firing and blistering spavin, I believe in firing and blistering hocks, whether there is an exostosis or not. I do not know that there is anything new in the way of treatment ; there may be in isolated instances, but it takes a good many cases to convince me that a man has discovered a new remedy. I do not accept the first published statement, nor the second. So that, with regard to treatment, I must say that I have nothing to add. I might say regarding neurectomy, which is occasionally worth trying, that if more nerves were cut in the operation there would be more likelihood of an improvement, but so long as the neurectomy is confined to one nerve, or even two nerves, the prospect of improvement is not likely to be considered great.

Mr. SAMPSON : I quite agree with Professor Macqueen in one thing, that is I think Major Smith might have given us his opinion as well as ask questions. He gives us several causes of spavin, and Professor Macqueen gave us several causes. I have one cause both gentlemen omitted— that is, sprain, or straining. I will give an illustration. I had a grey Irish mare some years ago—four years ago—and could have sworn she was a sound mare. I rode her regularly, hunting, and during a run one day we got a stiffish piece of rail. I put her at it, and she gave a tremendous grunt when she landed. Before she got across the next field, which was grass, she swung her hind leg. She just pottered about that day, and was taken home, and within a fortnight that mare developed a spavin. I believe that spavin was caused by trying to clear those rails. She was cured, but was never exactly sound. She worked for seven or eight years afterwards. I firmly believed ever afterwards that that strain was the cause of her spavin. With regard to spavin, I think Major Smith says he is guided mostly by sight. Professor Macqueen, I understood him to say, is guided by touch and sight. I also go by something else as well. I go

by touch and by sight, and also I notice the action. If you have a horse run round after you have felt his hocks front and back, and if you find a horse runs like that, and the other one like that, you may be sure there is something the matter with that hock, either spavin or something else. I think the three combined methods of examination are good. Professor Macqueen asks, when there are no coarse hocks, can we have that without the hock being unsound? My opinion is that you could have it, but the chances are very much against it. Where you get one coarse hock without being an unsound one, you would get 20 coarse hocks which were unsound. He also asks, does the toe of the shoe get worn, and how is it that it does get worn? I think it gets worn because a horse with a leg which is affected with spavin gets that off the ground and gives a sort of twist with it. He does not bring it straight up. There is a sort of half twist, and I think that is why the shoe is worn. Professor Macqueen also asked us to express our opinions about stiff hocks. It is a very difficult question indeed. If a horse has got what we may call stiff hocks or coarse hocks, and he goes with a very fairly sound action, it is difficult to say whether that horse should be purchased or not. I will put it in this way. A horse is sent to the infirmary, and you are asked to send a certificate back as to whether he is sound or not. You do not see the client. In a case like that, I should decidedly say "unsound," and be on the right side; but if my client was there and the horse was one, say, worth £120 or so, without coarse hocks, with fairly good action, and with coarse hocks he could be bought for £60, I should say, "Buy him and chance it." You can fire him after that. Professor Macqueen also asked us to express our opinions whether a horse with unsound hocks may still be useful. I say, yes; very useful indeed. There are plenty of horses who have been fired in the early stages, but who go through a hard day's run at hunting, and do it well. I do not think we should condemn every horse because he has spavin. On the other hand, there are plenty of spavins which cause lameness, and always will cause lameness.

Mr. A. I. MacCallum: I would like, Sir, to say a word on this subject, for the sake of getting a little information. Many an expensive law case has been brought about through one authority saying a horse was sound in his hocks and another high authority giving the opinion that the horse was suffering from spavin. Some of our members remember the story which the great Professor Dick used to tell in connection with his lectures. One of these stories comes to my memory now—the story he used to relate to us in order to impress the subject on which he was lecturing on our memories. It was a story something like this: "I happened to be from one home one day, and a client of mine called about a lame horse. The horse had run suddenly lame a few days before, and, as he had paid a high price for it not long ago, he was anxious about it. He did not wait for my own return, but took it to another gentleman who was also a professor"—Professor Dick used to say in telling it—"he took it to a great professor in this town, and what do you think he said was the cause of the horse's lameness? Plugging of the artery." The treatment for plugging of the artery did not take effect, and the horse was taken to Professor Dick. "What do you think was wrong with the horse?" asked Professor Dick. "He had got a bone spavin, and I treated him for bone spavin and he recovered."

Another case I was personally interested in. A dealer was in the habit, when he gave above a certain sum for a horse, of asking my opinion as to whether it was sound or unsound. In the usual course I had to look over some horses for him, and after giving him my opinion I forgot all about them. Some days afterwards he asked me if I remembered examining the horses. I remembered, and he said, "So-and-so has condemned them for spavin." He showed me one of the horses again, and I said, "The gentleman who gave that

opinion must have been suffering from bilious dyspesia." He said, "Give me your opinion." I said, "The horse is a sound horse." Then he said, "What am I to do? It has been returned on my hands, and I cannot sell him." I said I would think over it and let him know, and I kept the horse for a few days, and had some hair taken off his legs and some taken off his tail; perhaps he was docked, but I cannot remember. He was put in another stable, and the same gentleman was asked to examine him, and he passed the horse as sound. It is not so bad when one man gives an opinion that a horse is sound, and another man says he is unsound, but it is very different when the same man gives the different certificate. It is a well-known fact that when a horse is suffering from spavin the muscles waste, and he goes lame. One day a gentleman brought a horse to me, and I was at a loss to know how the horse could go sound with a diseased condition of his hocks. I had his shoes taken off, and found he had a tight shoe on the opposite foot. One is apt to be dissatisfied sometimes when the soundness is caused by the treatment of a foot with a tight shoe. As regards treatment, I think the old-fashioned way of treating lameness by firing and blistering, and giving a long rest, is the most beneficial. But it has its drawbacks.

Lieut.-Colonel STEEL: Anecdotes with regard to supposed spavin and real spavin might be prolonged indefinitely. I did not intend to trespass on your time, which is now very nearly exhausted according to the time table, only I happened to possess a very unique specimen which favours favours the idea enunciated by one of the recent speakers, that sprain of the ligaments coating the bones of the hock may be the cause of spavin, in that the inflamed ligament becomes ossified. Here is a very pretty little specimen, which has a very small exostosis in what is called the spavin place, which would suggest to the seller that it was of no consequence whatever. A purchaser advised by a veterinary surgeon would say immediately, as Major Smith says, that the degree of lameness does not depend upon the size of the exostosis. In the specimen I have here the protuberance is a mere pea, and might very well be removed by the trick, I will call it, of chipping it off, and immediately all the symptoms of spavin, so far as handling is concerned, subside. Allow me also to take the opportunity of stating that I agree with the very practical remarks of the speaker I have alluded to as to the importance of action. I consider the addition of that test to observation for the detection of symptoms, by feeling and viewing the part, of the very greatest importance. Suppose we had doubtful hocks, or irregular hocks, and they were exactly alike, I should hope they were sound. If I submitted them to the test of trotting, I should expect to hear the 1, 2. I never heard a horseman describe perfect action without saying the horse went 1, 2, 1, 2. I should hope he was sound. It is very improbable that the disease would proceed with equal strides in both hocks, and if he is submitted to the further test of turning sharply, and so on, I will swear he is sound. It is a very summary way of judging, but I happen to have had considerable experience on this very matter. Many years ago, when a very young man in my regiment, the 12th Lancers, we bought 400 young horses, three and four years old, in about four months. I was considered an excellent anatomist—and I considered myself a good anatomist, though I have been rather doubtful about it since—at any rate I considered myself a thorough judge of hocks, and I rejected horse after horse having spavin. The dealer, Mr. Reynolds, of Dublin, got rather disgusted with having to send these horses to Liverpool to be sold as cast horses, and there was a little conference between Mr. Reynolds, the commanding officer, and myself, the result of which was that he agreed to take back any horses that I pronounced spavined that became lame at the end of 12 months. The result was that out of about 70 horses I rejected only eight became unsound. I had

objected to these 70 horses fairly according to the ordinary rules of judgment for the conformation of hocks. The specimen I have here is well worth looking at.

Principal WILLIAMS, Edinburgh: Major Smith has to a very great extent expressed ideas that I have myself as to the pathology of spavin, and as to its nature. My opinion is this, that in spavin lameness there are hocks and hocks. There are many hocks which when we are young we should condemn for spavin, as our friend the Colonel here did. We were exceedingly particular in our young days, and if we saw any alteration of the hock, a little enlargement, we at once announced a case of spavin, and the animal we said was unsound. But as we gain experience with age we are not so particular, because we have found, like Colonel Steele, that a great many of these supposed spavin cases remain perfectly sound for many, many years, perhaps during the whole of life. As to the question of one hock being a little bit larger than the other, of course if both hocks were equal, although large, the horse would have coarse hocks, but if one was a little larger than the other, that enlarged hock was a spavined hock—that was our view. I have seen many hundreds in my day, and I have seen a great number where the odd hock has remained sound for many years. What I do is this. I examine a great many horses, and I have an arrangement made between the buyer and the seller to have a warranty for three or six months, and if at the end of that time the horse remains sound, the buyer retains the horse; if it falls lame, the seller takes its back again. In many of these cases the horse remains sound for years.

As to the pathology of spavin, the bony enlargement, the exostosis, is simply material for the purpose of removing the cause of lameness; so long as there is a slight movement in between the cuneiform bones, this slight movement causes pain upon the inflamed surface of the bones, and the pain causes lameness. But when the exostosis has united these bones together, the movement is arrested, and there is no further cause of pain. There are two ways by which this is done. I have examined hocks very, very carefully, and I must say that Professor Coleman was perfectly right when he taught his students to swear that if a horse was lame behind, he was lame in the hock. I have met people who have said that a horse was lame in his hock joint, and others in the hip or some other joint. I have had the opportunity now for over 30 years of examining the limbs of lame horses on the dissecting-room table, and I can safely say that for one case of lameness in a hind limb which I find in any articulation, I see at least the greater part of 100 situated in the hock. I think that is certainly of assistance to us in the diagnosis as to the seat of the disease, and that spavin-lameness is due to inflammation of the bones. In the ordinary small spavin in the cuneiform, and perhaps the small metatarsal, a process of union between the two, or between the small metartasal and the cuneiform, the process of ossification or ankylosis is a very short one. They become united together in the course of a few weeks, and when this union has taken place the horse may remain sound as long as he lives. The smaller the spavin, the greater the chance of a permanent cure of the lameness. If it is a diffused spavin, involving perhaps the magnum cuneiform, medium, and perhaps the head of the large metatarsal bone, I find the lameness is most persistent, and that it is a most difficult matter to remove it. But when it is limited, and the healing takes place, it takes place in two ways. First of all you may have a hock with the bones united together just upon the outer side—not a complete union, perhaps, but united here and there by patches of ossification which prevents all further movement, and that case remains sound. In other cases, again, the ankylosis will surround the whole of the hock, and both bones will be united simply at their borders. In other cases, again, if you separate

these bones you will find that there is no change whatever on their articular surface ; the cartilage looks quite healthy in this case. Then there are other cases where the cartilage is eroded, worm-eaten, and full of little holes. You find a roughened surface where the process of ossification is very slowly going on, or perhaps in abeyance, and although this erosion may be found if the external ankylosis is completed, there is no movement, and the horse goes sound. There may be a little stiffness, but he remains practically sound. I am clearly of opinion that the interosseous ligaments become affected secondarily, that the change takes place from the concussive shock when the foot is brought to the ground, that the concussive shock sets up ostitis ; and the bone-spavin manifestation I look upon as a process of cure—a throwing out of reparatory material in order to prevent further movement, and in this way remove the source of pain.

Major SMITH : Mr. President and Gentlemen,—I shall probably find it utterly impossible, without tiring your patience very considerably, to reply to all the speakers who have touched on this paper. I therefore especially direct my reply to the criticism offered by Professor Macqueen.

Professor Macqueen finds fault, in the first instance, with the style of the paper—the scrappy manner in which it has been put together—and considers that it might have been presented to you in a greatly improved form. Probably he is right. But at the same time I think that the particular style I adopted has proved a most successful one, for it has enabled him in a very masterly manner to dissect the views I hold on this particular question ; and, in addition—which is infinitely more valuable to you—he has presented you with his own views.

Professor Macqueen considers it utterly unimportant whether the disease commences in the bone or in the cartilage, and, speaking generally, I am sure I do not care where it begins. I am glad of his opinion on the matter. It is a question that pathologists will have to settle. Probably the ordinary practitioner, though he may specialise a little, will find that his opportunities and facilities are not sufficiently numerous to enable him to settle a question of this sort, and from a practical point of view it does not matter a rap.

On the question, however, of concussion, I am very glad indeed that Professor Macqueen has asked me to explain how concussion can occur off the ground. I thought at one time of leaving that out, but on reconsideration I put it in, and I did so for the particular reason that I had in the paper I referred to devoted rather a short paragraph, but I think sufficiently clear, explaining how concussion will occur to the hock when the foot is not on the ground at all. With your permission I will read this paragraph, as it is not a very long one :—

> Though the range of motion between the tibia and the astragalus is so considerable, yet it is not fully exercised in all the paces ; it is only in the jump and the gallop that the angle formed between the tibia and metatarsal is closed to any great degree. If when the joint is completely closed in the dead dissected limb, we look at the posterior part, namely, the now uncovered ridges, we find that when the part is flexed to the uttermost the tibia and astragalus are no longer in apposition—the tibia has left the astragalus and a space is left between them. To prevent flexion to a dangerous degree, two stops are placed on the anterior face of the inferior extremity of the tibia, one outside and one inside, the outside being the larger of the two. These stops come in contact with two rests on the astragalus, and in this way, rightly or wrongly, I think that a certain amount of jar may be imparted to the astragalus. As the inside stop comes into contact with the astragalus slightly before the outside stop, I conceive it possible that the inside of the astragalus receives more concussion than the outside. Can this help to offer any explanation of the position of spavin?

That is an answer, or an attempt at an answer, of the question Professor Macqueen asked, as to how concussion can occur when the foot is off the ground.

Professor Macqueen tells us that spavin is not hereditary, nor am I in a position to bring forward facts to disprove his statement. In speaking of spavin as hereditary, one has naturally been very largely influenced by the views which are held by breeders and others who have formed the opinion that spavin is hereditary. In many cases probably this opinion is based on tradition, but in others as the result of their own powers of observation. The Professor is quite right in mentioning the report of the Horse Commission. It was there that I saw the views of these experienced witnesses, and I was very largely influenced by them in making the statement contained in this paper. I rather wonder the question has not been dealt with by other speakers in the room. I was influenced by this report because the people called before the Royal Commission no doubt knew what they were talking about.

Professor Macqueen does not agree with the classification of the curable and incurable form of spavin I have given. There is a curable form and there is an incurable form. As a rough and ready practical method of defining a spavin I hold that the statement I made was quite correct. I have said that the small metatarsal bones are rarely involved. Professor Macqueen thinks otherwise, and says that he has two or three specimens on the table which go to prove the incorrectness of the view I hold. He has not told us how many hocks he examined in order to get this number.

I have not had much opportunity of late years, but at one time every horse I destroyed, or every horse that died, I examined the hocks of. In that way I carried about the world with me many more joints than most people would care to carry about among their luggage, and after they had been thoroughly classified I deposited them in a museum. I made my diagnosis while the skin was on, and committed that diagnosis to writing. Then I made a cast of the hock, so that I got a complete representation of the hock during life. Next I dissected my joint and cleaned it, or boiled it, as the case may be, and compared my written opinion before the skin was removed, with the notes made after the joint was dissected. I should not like to say how many times I was right: very, very few. The mistakes one made were perfectly dreadful, and it was the number of mistakes I made in endeavouring to carry out work on lines of absolute exactitude that made me, and has since made me, extremely careful indeed in giving an opinion about a hock. I assure you, particularly the younger members—who perhaps are much more cocksure about an opinion than we are—that I recommend that method of inquiry. Take half a dozen hocks, form an opinion and write it down. Then dissect them, and see how far you are right.

Professor Macqueen has dealt rather severely with the question of Touch *versus* Sight. I examine a great many hocks in the course of a year, many hundreds, and feel sure that a man who trusts entirely to touch would make more mistakes than a man who trusts entirely to sight. But at the same time I should never think of giving an opinion simply from sight, because, as Professor Macqueen urged, there may be a distended vein, or a thickening of the skin, which would of itself give rise to an enlargement which, if occupying the proper place, would be regarded as a spavin. But sight and touch combined are, I feel sure, much more useful and valuable than touch alone.

Professor Macqueen goes on to say that one hock coarse and one fine constitutes a sound condition. I wholly disagree with him. I think it is the only point on which I can flatly contradict him. I say if a horse has one hock larger than the other I do not see how you can say it is sound. It may be perfectly sound, but I do not see how you can say it is. He adduces as evidence—and he always gives evidence which is of great value—that human feet may be unequal in size, and hands, eyes, ears, and so on—all these are given as examples of unequal development. Now, if we found as a matter of

everyday occurrence that hocks did differ in size, and yet be absolutely sound, we should be compelled to agree with Professor Macqueen ; but that is not the case. Hocks are either pairs or unequal, and the common rule of practice, and a perfectly sound one, is that if the hocks are not pairs there is something wrong. I am sure that is right. It is a common rule of practice which we have inherited from those who have gone before us, and there is nothing that Professor Macqueen says which has in any way disproved it.

Professor Macqueen mentions a paradox. Probably there are many in this paper. It is this: " Experience shows that an enlargement which constitutes a spavin in one horse may in another be perfectly normal, and it is this paradox which expresses in a nutshell the defects of hock judging. If Professor Macqueen will allow me to utilise one of his specimens here, it is a very excellent example of the difficulties that one may meet. Look at this enlargement at the head of the large metatarsal bone, look at that well developed ridge upon the medium—I say such a hock as that, clothed with its ligamentous structure and the skin and anything else that may be there, will handle very large indeed, and I shall be glad if some of you interested in the question will take the opportunity of looking at it and some other preparations which the Professor has very kindly brought down for our benefit. Here is an example of a hock which I assume is absolutely sound ; yet look at the size of it, look at the size of the ridge, and look at the enlargement on the metatarsal bone. If its fellow is the same size, that hock is sound ; but if its fellow has not a similar enlargement upon it, that hock would be considered diseased. Therefore I hold that the paradox I mention in the paper is a perfectly correct one—that what will constitute a spavin in one horse does not constitute a spavin in another.

Doubtful hocks should be examined from both sides is a statement which I have made, and Professor Macqueen says he can give an opinion from an examination on one side. I think he did not probably read the paper with very great care, or he would have seen it was a doubtful hock which I advised should be examined from both sides. He says he can give an opinion from the one side, but I do not think in a case of doubt he would content himself with examining from one side.

Professor Macqueen asks what are the causes of the lameness. I think the question I propounded is a much more practical one—Will the spavin lame ? Surely to goodness that is an infinitely more valuable question, and one to which we should be very glad to get a truthful answer, rather than what is the cause of the lameness. What does it matter to us what the causes are ? If you have a man who is going to buy a horse at 150 guineas, and you see that the hock is affected, you say he has an enlargement of the hock. Will it lame him ? is the first question. I cannot say—I do not know. The professor says, on the other hand, that that does not interest him in the least. All he wants to know is what are the conditions which are likely to bring about the lameness.

He mentions—this is rather an academical point, which perhaps he will settle later on—in connection with the cause of lameness, stretching of the periosteum. I should like to know how much periosteum covers the cuneiform bones. I should like to know how much periosteum is on the scaphoid, and how much there is on the astragalus. There is none, Sir, or very very little. You will find that ligamentous tissue covers over the surface of the cuneiform bones, and there is not a particle of space for periosteum to exist.

Professor MACQUEEN : When I made the statement about stretching the periosteum, my words were that it was the custom, at one time, to regard stretching of the periosteum as the cause of lameness. I did not regard it as the cause of lameness, but that was the custom, and I should refer you to authorities if you gave me a few minutes.

Major SMITH : My point is that there is no periosteum around the bones I have mentioned.

Professor MACQUEEN : I do not dispute about the periosteum. One time it was considered to be the cause of lameness.

Colonel STEEL : Is there any bone of the body not covered by periosteum ?

Professor METTAM : I say that Professor Macqueen is wrong ; that the periosteum is never found on small bones where there is a covering of articular cartilage, or where ligaments or tendons are inserted. Such is the condition observed in the small bones of the carpus and tarsus. That, I think, is fairly well understood, and has been understood for some time.

Major SMITH : Several questions have been asked which I ought to have made a note of, but which, I am sorry to say, I did not. One question was in connection with the prognosis. I say the prognosis in ordinary spavin is uncommonly good. A great many horses go through life and are never influenced by the spavin. I say that the prognosis in spavin lameness is good ; that it is only a small proportion of horses which is affected by true articular disease.

Mr. Sampson took me to task, also, for not answering questions as well as propounding them. I think that I have endeavoured to answer the questions, and, in order to make the thing as clear as possible, I put my answer under the head of "Writer's Views." I think if my paper had been read by the speaker, he would have found that I judged hocks both by sight and touch. I extremely regret having kept you so long, and that my reply should have been so discursive.

CONTAGIOUS DISEASES ANIMALS ACT, 1864 AND 1899.

SUMMARY OF RETURNS OF OUTBREAKS, for the four weeks ending **September 9th, 1899.**

ENGLAND AND WALES.

Pleuro-Pneumonia.	Swine Fever.	Glanders (including Farcy).	Rabies.	Anthrax.	Sheep-Scab (for month of August).
None.	Outbreaks 103 Slaughtered 1,232	Outbreaks 71 Attacked 99	Dogs 2 Other animals 0 Destroyed 21	Outbreaks 32 Attacked 82	Outbreaks 6

SCOTLAND.

None	Outbreaks 5 Slaughtered 19	Outbreaks 5 Attacked 30	None	Outbreaks 5 Attacked 5	Outbreaks 2

IRELAND.

None	Outbreaks 26 Slaughtered 699	Outbreaks 1 Attacked 1	Dogs 6 Other animals 1 Destroyed 1	Outbreaks 0 Attacked 1	Outbreaks 15

THE SANITARY UNION CONGRESS.

Conference of Veterinary Inspectors.

In connection with the annual congress of the Sanitary Institute held at Southampton, there was a conference of veterinary surgeons held in the Council Chamber of the Hartley College on August 30th. Mr. W. Hunting, F.R.C.V.S., presided.

Difficulties of Dealing with Tuberculosis in Cattle.

BY T. B. GOODALL, F.R.C.V.S.

Abstract.

The intention of the paper is not to throw discredit on what has been done with regard to tuberculosis, but rather to point out to the difficulties of carrying into effect the methods suggested for dealing with the question.

Unless the Government are prepared to take the matter in hand, the position of the veterinary surgeon is not an enviable one. He may detect the disease and offer suggestions, but he has no means of knowing whether they are complied with.

Judging from the tenour of a speech reported to have been delivered by Sir G. Brown to the students at Cirencester College lately, we can scarcely expect the Government to deal with the question.

We take it for granted now that tuberculosis is very prevalent amongst cattle, and that there is a certain amount of danger to man by his ingesting the uncooked milk from such animals.

By the application of the tuberculin test, we can detect almost infallibly affected animals.

How is the veterinary surgeon to advise the owners of cows in small dairy-farms to deal with reacting animals—those that give no clinical evidence of being affected?

They must be either isolated, removed from the premises, or fatted for the butcher.

Either of these methods may be carried into effect by people of affluence, who merely carry on their dairies for a hobby, but not so with the dairy-farmer, whose whole capital is invested in his stock, but who has now but a narrow margin for profit—but if we say that he must be compelled to slaughter, or get rid of, or isolate, some 30 per cent. of his dairy stock, it would mean ruin to him.

With the general accommodation of an ordinary dairy farm genuine isolation is impracticable; there is but bare byre-space on the premises for the cows; we have no spare place for reacting ones; so that, unless they are kept in the same house as the healthy stock (which is mere quibbling with the question if the disease is so contagious as experts say), special isolation sheds must be erected on all farms.

And again, to give real effect to the many suggestions made, quarantine sheds must also be built for the housing of newly bought cows before they are tested and allowed to mingle with the herd.

Unless the veterinary surgeon has the power to mark or brand reacting animals, he has no means of distinguishing them; but the owner naturally objects to this because it would lessen the value of his cows.

There are other difficulties connected with the isolation of reacting cows.

If a farmer elects to sell his reacting cows, he may send them to market, where they may be purchased by another farmer, and the first farmer may buy in cows that have reacted, because none of them are marked or branded, and they cannot be identified.

If they are slaughtered they must be sold at a great loss to a second or third-rate butcher.

Recognising these difficulties I have refused to test the cows of dairy farmers, for I knew that they could not comply with the instructions and regulations that should follow.

To sum up, if the matter is taken seriously in hand, it seems to be necessary:—

(*a*) That dairy-farms must have isolation and quarantine sheds.

(*b*) That the veterinary surgeon must have power to mark or brand.

(*c*) And needs to exercise caution in certifying animals as free from disease.

(*d*) He should have power to control the movement of reacting animals.

(*e*) Unless the tuberculin test is made general and compulsory it is worse than useless.

In the meantime it should be a punishable offence for anyone to keep an animal in milk, with tuberculous disease of the udder, on any premises from which milk is sold to the public.

Cowshed Inspection.

BY SIDNEY VILLAR, F.R.C.V.S., COUNTY VETERINARY INSPECTOR, MIDDLESEX.

Cowshed inspection as at present obtains in this country is on a most unsatisfactory footing.

The conditions under which milking cows may be kept are in the hands of local authorities, who may make their own regulations as to sanitary arrangements of cowsheds in the occupation of persons following the trades of cow-keeping and dairying, and for the inspection of their milking cows.

Having made such regulations, the local authority may enforce them or permit them to be absolutely ignored. In consequence, cow-keepers in some districts, more especially in urban areas, are placed under rigid sanitary supervision, whereas in other districts milk is allowed to be produced under conditions and surroundings which may rightly be described as filthy in the extreme.

Milk so produced without sanitary restrictions at out-of-the way farms in country districts is, in these days of quick railway transit, sent to our populous centres.

This is detrimental to the public health, and unfair to the supervised cow-keeper.

The aim of official cowshed inspection is the production of pure milk—to this end proper provision for the health of the cows, the cleanliness of the animals, and their surroundings, and their supervision by competent officials, should everywhere be made compulsory.

Although in rural districts, where cows are housed for only a few weeks in mid-winter, or where they are kept continuously in the open, some laxity in the construction of cowsheds may be allowed to prevail, it is in exactly such places as this that the surroundings of the cows—more especially as to the water supply both for their drinking and for the cleansing of milk vessels, together with the situation of manure-heaps and cesspits—are found to be bad.

So many different views are held by dairy farmers as to the best design for cowsheds, and so many buildings not originally intended for occupation by

dairy cattle are converted to that purpose, that it is well for inspectors to deal broadly with the question of design, and to approve of sheds, provided certain fundamental details are complied with.

These essential details are such as provide for adequate ventilation and lighting, for an efficient water supply in or near sheds, and for floors and drainage so constructed as to render cleansing of the sheds effectual and easy.

Many opportunities have occurred to me of inspecting cowsheds in various parts of the country, and I am convinced that, speaking generally, there is no better method of housing milking cows that that in vogue on the better class dairy farms in the suburbs of the metropolis.

On most of such farms it is customary to keep cows in their stalls for at least eight months in the year. Some form of official inspection has long existed in these districts, and for many years past it has been the custom of the trade to invite purchasers of their milk, and the public generally, to call and view the cattle and their surroundings. In attempting to secure the approval of such visitors, practical knowledge of the most successful methods of housing cattle for the maintenance of their health and cleanliness has been accumulated by cowkeepers, and the form of shed now used is the result of actual practical experience of the requirements of cattle, combined with scientific details as to ventilation and drainage suggested or enforced by the officials of the local authority.

Undoubtedly, the most important factor in the sanitary arrangement of a cowshed is ventilation, and associated of course with ventilation is the question of air-space.

Provided effectual means for the frequent changing of the air within the building is secured, the cubic space allowed for each animal may be permitted to be considerably less without detriment to the health of the occupants than is by many supposed.

A shed in which 14 shorthorn cows have been continuously tied up during the winter for the past 10 years allows only 470 cubic feet per animal, yet it is within my knowledge that the cows keep remarkably well.

I do not advocate so small a cubic space, but am of opinion that a moderate-sized well-ventilated building is preferable to a large shed containing few cows, where the means of ventilation are blocked up to keep the interior of the shed at a genial temperature.

Bearing in mind the important part the wind plays in ventilation it will be recognised that the air of sheds in hilly districts, unsurrounded by other buildings, is much more readily changed than the air of sheds in populous places, provided that inlets for fresh air and outlets for polluted air are permitted to exist.

The amount of air required by an animal at rest is proportionate to its weight. Cows of different breeds differ enormously in weight; and the same animal at seven years old will usually weigh much more than a three years. It is therefore difficult to fix a mean aggregate area for inlet and outlet of air.

Mr. John Spier, an authority on this point, says:—"With a light breeze moving at from two to four feet per second, a byre may be amply ventilated with an inlet of 25 to 35 square inches per animal, . . . if the outlet area is at least equal to this." Another authority insists upon permanent openings, with an area of 54 square inches per animal for both inlet and outlet.

I am of opinion that in sheds which are continuously occupied a much larger ventilating area must be secured, with provision by means of louvres and shutters for varying both the inlet and outlet areas, depending upon the foulness and heat of the inside air and the position of the wind and temperature of the outside air. To this end ventilating openings should be placed

on the roof and in both the front and back walls of sheds, with means for closing such apertures in rough weather on the windy side and of opening them on the lee side.

It is desired to secure adequate movement of fresh air at the level above the floor on which the animal is breathing—*i.e.*, within two feet of the ground; but it is not generally permissible to put the inlet openings at so low a level as this: in only few and protected places can they be allowed. It is absolutely essential to protect a milking cow from cold currents of air or draughts; if such impinge on her she will probably quickly develop mammitis, or contract a "chill." The best position for the inlet openings is in the outer walls, about six feet from the floor. Almost any opening will do, but its floor should slant slightly up towards the shed, and its size should be made capable of regulation. Perhaps there is no better than an opening of three feet long by two feet wide, fitted with a glass window frame, opening at top and bottom on a central pivot.

In practice drain pipes inserted, or angular openings in the brickwork with their base to the inside of the shed, answer well. Such are usually stuffed with straw in cold weather—not an objectionable proceeding, provided its removal is not neglected. The cold air admitted by these wall openings will fall to the level of the cattle.

All windows to sheds should be made to open widely, and the external doors should be half doors; so that the top may, if need be, kept open night and day. Half-open sliding doors are draughty, and cannot be too strongly deprecated.

To provide for roof ventilation no loft or ceiling must be allowed, the roof itself being made of slates or tiles; best of all, of red pantiles, fitted to the rafters by pegs and without mortar. The interstices in this kind of roof allow of the escape of air, and the inflow of water is prevented. Corrugated iron and wood covered with felt are objectionable roof materials.

High up on the walls, or, better still in the roof—or if it be a span roof, at its apex—special outlets for the egress of polluted air must be provided. Perhaps nothing is better than a wooden chamber or dome with louvred sides running along the whole length or a considerable portion of the apex of the roof, such chamber opening directly into the shed, and capable of regulation by shutters worked with pulleys and cords.

Open fanlights in the slant of the roof have the objection that they admit rain.

Whatever the form of roof ventilation it must admit of regulation so as to prevent down draughts in certain positions of the wind.

As a rule cowmen keep their cattle in too polluted an atmosphere. It is not only necessary for an inspector to see that means of ventilation are provided, but it is also necessary to ensure that such means are taken advantage of

For the profitable production of milk it is necessary that cowsheds should be kept comfortably warm, an internal temperature of 58° to 60° F., combined with a fresh and sweet atmosphere, is the desideratum. In cold weather, if anything like 1,200 cubic feet for each cow is insisted upon, the sheds will have to be artificially warmed.

It has been suggested that cows should wear rugs, as is usual with horses. I have seen it tried; but they soon make them foul with their droppings, so that their general use is impracticable.

A cubic space of at least 600 feet should be provided for every cow; in calculating the cubic space the height of the shed above 14 feet should not be taken into account.

The provision of ample cubic space and ventilation is not in itself sufficient to prevent the spread of tuberculosis. In a well lighted, well ventilated shed, having an air space of 1,200 cubic feet per cow, seven out of 20 cows which

had been tested and declared free from tuberculosis showed a reaction when again tested at an interval of less than 11 months.

To secure the continued freedom of a herd of cows from tuberculosis, efficient ventilation, constant supervision, and frequent testing with tuberculin is essential.

Old-fashioned town cowsheds used purposely to be kept in a state of semi-darkness, the idea being that cows after a meal more quickly lie down and rest, and that under such conditions milk would be more profusely secreted. Now, however, the presence of light is recognised as essential to the maintenance of a high standard of health.

The value of a particular window depends on the access of light to it. In a shed unsurrounded by trees and other buildings I have found a window space equal to 1-30th of the floor space of the shed gives ample light to the interior.

It is important that dark nooks and corners where cobwebs and dust might accumulate should not be allowed.

Cowsheds may with equal propriety be built of brick, stones, or wood. If the latter, a brick or stone base of at least four feet should be insisted upon; the lower portion of all walls for four feet on their inside should be coated with a cement to secure an easily washable surface; this should be limewhited, but all portions of the walls above this should be limewashed three or four times every year.

Blue Staffordshire bricks, red bricks set on edge, concrete covered with cement and furrowed to prevent slipping, all make good impervious floors.

In some districts it is customary to make the floor of the standing of chalk for about three feet from the manger; this is softer to the knees and brisket of the lying down cow, and is of advantage where bedding material is expensive, but it has the objection that it cannot frequently be washed and is a source of dust.

A floor covered with cement is cheap, durable, and easily cleansed; but the material of the floor may vary so long as it is properly set and arranged for efficient drainage.

The design of the floor is important; the best form of floor allows of a depth of from five to six feet from the front of the manger for the cows standing, then arranged transversely to the standing should come the manure trench, a channel from 12 to 18 inches wide and four to five inches deep, made throughout of the same material as the floor. This trench is for the reception of the fæces and urine, and is so arranged that these excreta should drop directly into the channel and not on to the standing place, so keeping the hind quarters and udder of the cow out of the filth.

The floor of the standing should have a fall from the manger to the manure channel of an inch, and the floor of the channel itself should have a slight fall outwards, so that the urine gravitates to its outer edge; the channel should be carried from one end of the shed to the other, having throughout a slight fall to its outlet; should go through the external wall, and discharge on to a proper gully.

This channel drains off the liquid and permits of the easy removal of the solid portions of the manure.

At the back of this channel comes the milking passage, which should be at least five feet in width.

The cow-standings should be slightly elevated above the passage.

The standings may be arranged for one or two rows of cows. In a double shed—*i.e.*, one containing two rows—it is important that the cows should not face each other: their tails should be towards the central line of the shed.

The mangers may be set close to the wall, or at a distance of about four

feet six inches from them; this forms a feeding passage in front of the manger, which is, however, of great utility as an aid to ventilation.

Perhaps the best kind of manger is the half-round salt-glazed pipe, set in brickwork with cement, not more than five inches above the floor, and running the whole length of the shed. It forms a continuous manger, not subdivided for different cows. At its lowest point is a channel, controlled by a plug, leading to the manure-trench. With such mangers cleanliness is easily secured.

Mangers of iron, or of brick lined with cement, answer very well.

At two cowsheds within my district no mangers are used. The cows are secured in their stall by the neck-travis or clapse, and their food is placed before them in heaps on the floor of the feeding-passage. After each meal the floor is swept. Very little hay is used, but such as is given is also placed on the floor. It is altogether the cleanest method of cow-feeding that I have seen.

Standings or stalls are made to accommodate a single cow or two cows. Both the single and double-stall systems have their advocates. I prefer the double stall.

A standing for two cows need not be more than six feet six inches in width; two cows will stand and lie very comfortably in this space. If more room is allowed the cows will stand across the stall, and their droppings will fall on their beds.

The width of a stall for a single cow must be at least three feet six inches.

The depth of the stall from the manger to the manure channel should be, as I have previously pointed out, from five to six feet, the depth of the standings varying in each shed so as to accommodate cows of different length.

It is a frequent custom to put the mangers close in to the wall, and so to tie the cows with their heads to the wall; theoretically this is wrong, but in practice, provided ventilators are placed about three feet above their heads, it does not appear to be harmful or conducive to the spread of disease.

Veterinary surgeons know that the infection of pleuro-pneumonia, eczema epizootica, and probably also of tuberculosis, is not so often conveyed by the diseased cow to the nearest animals as to others farther away; it is a well-known fact that the two earliest detected cases of disease frequently occur in cattle placed at different extremities of a shed.

Where cows are watered in their stalls directly from a main or cistern, an iron or zinc gutter, about nine inches wide, fitted about 18 inches above the manger, and running the whole length of the shed, is a good plan, the water being turned into this gutter twice daily. Occasionally the continuous manger, such as I have described, is used for both feeding and watering.

Iron or zinc vessels, one to each standing, continually filling, but controlled by a ball-tap and cistern inside the shed, answer well, but require much looking after to keep them clean.

There is some advantage in watering cows outside their shed, six or eight being turned out together for that purpose. Should anything be amiss with any cow it is more noticeable when she moves, also a fresh supply of air gets into the standings when they are unoccupied.

There is no risk to the animals' health, even in the worst days of winter, by turning them into a yard to drink, provided they are not kept out very long. Water should be supplied in troughs; cows should not be allowed to drink at ponds which quickly become foul from their evacuations—not that water so soiled is injurious to the health of the cattle or that the drinking of it affects the purity of the milk, but dirty water or water contaminated with fæcal matter splashing on the udders or teats may find its way to the milk pail.

A pure water supply for the purpose of cleansing the milk vessels is of greater importance than the purity of the water supplied to the cows themselves.

In a shed with its floor made as I have suggested, no covered drain need be in the building. All urine or liquid filth is carried to the outside of the shed by the manure channel and is discharged on to a proper stoneware gully, of sufficient size, connected to a drain leading to a cesspool or sewer. Such drain should be properly disconnected by means of an intercepter, provided with a sweeping arm. Provision must be made for the inlet of fresh air, and at the head of the drain a ventilator of a diameter of at least four inches should be carried to a point above the ridge of the shed.

The best bedding material for cows is wheat straw. In districts where straw is very dear fine wood shavings or sawdust, although of low manuria value, are clean and efficient substitutes.

Peat moss litter has the objections that it always looks dirty and is apt to block drains.

To "muck" a shed out twice in 24 hours is not sufficient; it should be done oftener, and as necessity arises in the working hours, but it must not be done when the cows are resting—to disturb at this time diminishes the milk yield.

Sufficient attention to the grooming of milch cows is not usually given. The teats and udders should be washed before each milking, and the bodies of the cows cleaned every day. Many owners object to their cattle being washed. At one shed under my supervision the hind quarters of the cows are washed daily with cold water; no colds are caught or chills taken in this process, and the appearance of the cows is immensely improved thereby. It is very necessary that the milking stools should be washed frequently; the milker is continually handling them, and if dirty they foul his hands, which are to be immediately engaged in milking. Cowpox may be spread from a diseased to a healthy cow by means of a dirty milking stool; probably contagious mammitis of cows would be also so conveyed from animal to animal.

Normal milk within the udder receptacles of the cow is practically sterile. With the intention of limiting, as far as possible, the access of bacteria to the milk a piece of clean linen or a fine strainer covered with a layer of cotton wool put at the top of the pail during the process of milking will be found to much lessen their quantity. With the same end in view the shed floors should be washed daily with clean water, and no poultry, horses, or pigs should be kept in the cowshed; the manure heap or receptacle also should be quite 40 feet from the door of the shed, and grain pits having impervious sides and bottoms should be outside the shed and so arranged that the effluvium from the grains does not gain access to it.

Much of the subject matter of this paper could have been more efficiently dealt with by an architect.

For the control of our milk supply cowshed inspection is very necessary. I have already alluded to the necessity of the use of pure water for the cleansing of milk vessels.

Bearing in mind that milk is so frequently contaminated with the germs of disease after leaving the cow, it is obvious that the health of cowmen and their families is of paramount importance; but hardly less important, if at all, is the condition of the health of the cows themselves.

In an issue of model bye-laws for the use of local authorities, under the Dairies, Cowsheds and Milkshops Order of 1885, provision is made in Article 2 for the inspection of cattle in a dairy by the medical officer of health or inspector of nuisances; no mention is made of inspection by veterinary surgeons. Recognising the responsibility of the position of medical officers of health, no one can suggest that dairy cattle should not at all times be open to their inspection.

On the other hand it is difficult to understand why inspectors of nuisances should be inspectors of cattle. We see announcements in local newspapers of sanitary inspectors being appointed inspectors under the Diseases of Animals Act, 1898.

I am told that the duties of an inspector of nuisances or sanitary inspector necessitates his attendance at all outbreaks of scarlatina, diphtheria, and other contagious disease in his district, that he has to supervise the disinfection of, or himself to disinfect, the apparel and bedding of the patients, to superintend their removal to isolation hospitals, and pay frequent visits to those institutions.

It is incredible that any gentleman who has these important duties to perform can properly be in any way associated with the production and distribution of milk, a fluid which is at all times ready to absorb disease germs, and which forms such an excellent medium for their growth, multiplication, and eventual distribution.

To recognise the existence of disease in a cow, and to correctly estimate its importance to the public health, requires a special training only acquired by years of study. Some knowledge of bacteriology, skill in the use of the microscope, and, above all, an actual practical experience of the details of the daily life of dairy cattle, are essentially necessary. I venture to think that such a combination of scientific knowledge and practical experience is but rarely found, except in members of the veterinary profession. I confidently anticipate that the day is not far distant when all local authorities will number amongst their appointed officers a duly qualified veterinary inspector.

Discussion.

Mr. FORD referred to the necessity of making the Milkshops and Cowsheds Order compulsory. At the present time it was not compulsory on rural authorities, and until they had some compulsory measures for authorities he did not know that much could be done. They had been in the hands of those who were supposed to know better than themselves in the matter of legislation, but they had not done their duty with regard to cowsheds, farm buildings, and other houses. People in the country were rapidly rising to the fact that they were going to have their health preserved whether the landlords wished it or not.

Mr. SHELMARDINE referred at length to the question of ventilation, and said that the more ventilation cows had in their sheds the better they were; but, from what he gathered, cow-keepers said that cows gave more milk when they were kept warm. The drinking of pure water was a very valuable thing coupled with a thorough cleansing of all utensils.

Mr. SLOCOCK said the three most important essentials were ventilation, light, and a good supply of pure water. He put light first, ventilation second, and water third. They found a difficulty in getting people to erect ideal sheds, and if anyone had sufficient accommodation for 12 or 14 cows with sufficient tieing up room, he did not see why they should not remain there.

Mr. GOODALL advocated the raising of the flooring of cowsheds, which flooring should be dry. The buildings should have a sunny aspect, say south or south-west, open from end to end. Chalk floors were as good as they could have.

Councillor ROBERTS said they must all fully recognise the importance of a pure water supply for drinking purposes. What cows drank affected the milk just the same as when a mother took physic it affected the child she was nursing.

Alderman CAIN said he had been surprised to see cows in a healthy condition grazing upon a sewage farm. There was no disease among the

cattle, which were kept on a sewage farm for a specified time, and they frequently took prizes at Wakefield market.

Mr. A. L. BUTTERS referred to the difficulty which would result in regard to the rebuilding of sheds and the removal of cows, and dwelt at length upon the importance of ventilation, which, if perfect and adequate, would do away to a large extent with the necessity of removal.

Captain J. MOORE dealt more particularly with the efforts made to get rid of tuberculosis. It was an important matter for the Government to take in hand, and especially if they had to pay for every cow destroyed. They must have reform in some respects. He pointed out several means of ventilation which were requisite in order to keep the cows at a proper temperature and not subjecting them to draughts. Taking the matter altogether, he came to the conclusion that the whole matter must be dealt with with a firm hand, and could only be done by legislation, even though the Government had to come to the assistance of the farmers, many of whom hardly knew how to pay their way.

Mr. HOBDAY gave particulars as to some forty cattle which he visited in two very large sheds, the sanitary arrangements of which were in their way perfect. It was a model cowshed, but, as to ventilation, he found the temperature of the shed so hot that he could scarcely breathe. That showed a lack of ventilation. He advised the owner to keep the cows in a cooler atmosphere, with the result that their milk was very much improved.

Mr. W. G. DAVIS related his experience as to visiting certain sheds and finding the ventilation not what it ought to be. As a result of the improvements afterwards made in the shed, the condition of the cows was materially improved.

Colonel JONES, V.C., preferred to keep cows apart by a small wall, and advocated a large space being left between each cow. The inspection ought to be done by veterinary surgeons. He also advocated more perfect hygienic arrangements.

Mr. VILLAR replied on the various points raised, and thought there were some hazy ideas as to the quantity of air which cattle should have. Ventilation was a most important factor. If there was no cure for tuberculosis ventilation would go a long way towards its mitigation. The only way in which his suggestions could be carried out was by special legislation.

It was unanimously resolved "That the council of the Sanitary Institute be recommended to urge upon the Government to take steps by which the adoption of the provisions of the Cowsheds, Dairies, and Milkshops Order should be made compulsory upon local authorities."

It was further resolved "That the Government be urged to undertake a scheme for the reduction of bovine tuberculosis; and that they endeavour to secure similar action on the part of other associations interested in the subject."

THE SANITARY INSTITUTE.

IN the Sanitary Science and Preventive Medicine Section, on 1st September, Mr. F. VACHER, medical officer of health for Cheshire, read a paper on "The Control and Inspection of Imported Meat."

Mr. R. S. MARSDEN, medical officer of health for Birkenhead, followed with a paper on "Slaughter-houses," and advocated the adoption of public abattoirs in both urban and rural districts.

Dr. B. ANNINGTON read a paper on "Guarantees of the Purity of Milk Supply." He showed that while there was an absence of effectual guarantees it was desirable that all possible safeguards should be adopted. Among the remedies he suggested were the "breeding out" of tuberculosis, testing all breeding stock with tuberculin, separating diseased from healthy cattle, slaughtering all that showed signs of advanced disease. Among the precautions to be taken for the protection of milk was the exclusion of persons in an infectious state, including phthisical persons, from all kinds of dairy employment.

At the close of the discussion it was resolved :—

That the council of the Sanitary Institute be recommended to urge the Government to undertake a scheme for the reduction of the prevalence of bovine tuberculosis.

Notes and News.

MR. HARRY S. LEONARD, M.R.C.V.S., of 15, Ogleforth, has been appointed by the Markets Committee of the York Corporation assistant veterinary inspector of the York cattle markets.—*York Evening Press*, September 20th, 1899.

HOLOCAINE HYDROCHLORIDE in wafer-like tiny tabloids are now made. Each tabloid contains 1-50th of a grain of the salt. Holocaine is used in ophthalmic surgery, and produces anæsthesia of the conjunctiva far more quickly and completely than cocaine. It has not, however, any chemical relation to the alkaloid, being prepared by the interaction of phenacetin and paraphenetidin.

DEATH FROM ANTHRAX.—Another death from anthrax is reported to have occurred at Worcester, where a lad, aged 13, employed at a horsehair factory, died of the disease, induced, it is believed, by his scratching a pimple while engaged in manipulating horsehair imported from abroad. This is the third death which has occurred in Worcester from this cause within the last few months.

Communications, Books, Journals, etc., Received.

Veterinarian; Record; Bulletin of The John Hopkins Hospital; The Journal of Comparative Medicine and Veterinary Archives; The Scottish Medical and Surgical Journal; American Veterinary Review; The Public Health Journal; The Journal of the Jamaica Agricultural Society; Queensland Agricultural Gazette; Petersburg Veterinary Society's Journal; Revista Veterinaria (Vitoria); La Riforma Veterinaria (Naples); Recueil de Médecine Vétérinaire (Alfort); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Berliner Thierärztliche Wochenschrift (Berlin); Deutsche Thierärtzliche Wochenschrift (Hannover and Karlsruhe); La Clinica Veterinaria (Milan); La Revista Veterinaria (Buenos Aires); Agricultural Journal (Cape Town); Bulletin de la Société des Sciences (Bucarest).